GAS JOURNAL

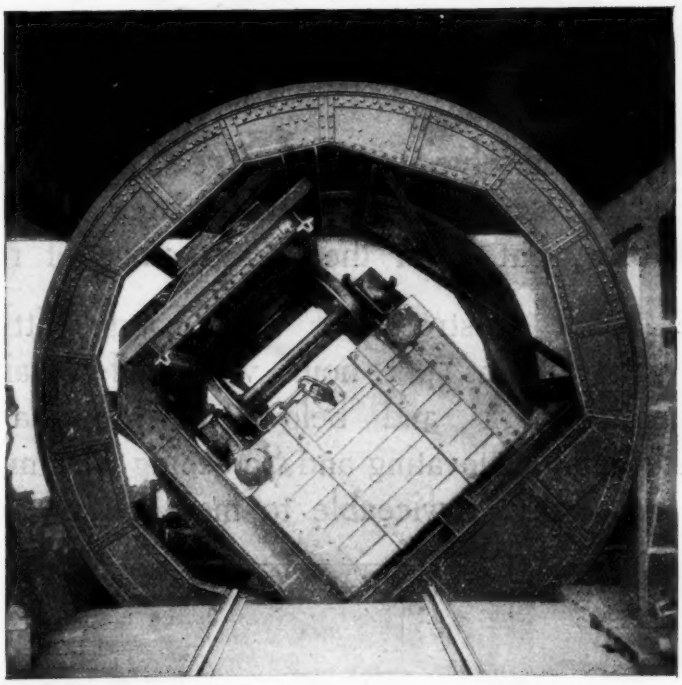
LIGHT ✣ HEAT ✣ POWER ✣ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CXC. No. 3490.] LONDON, APRIL 9, 1930. [82ND YEAR. PRICE 1s.

WAGON TIPPLERS

MECHANICAL HANDLING PLANT FOR ALL CLASSES OF MATERIAL.



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SKIP HOISTS

SCREENS OF VARIOUS TYPES

TRUCK TIPPLERS

SKIP FILLERS

CONVEYORS ETC.

MANUFACTURED BY:—

STRACHAN & HENSHAW, LTD.

WHITEHALL IRONWORKS, BRISTOL.

GEORGE GLOVER & CO LTD.

The "New M" Patent Lock

Increased Efficiency : Reduced Price

Several new and important features have been recently incorporated in the "*M* & *M*" padlock, the latest pattern of which will in future be known as the "*New M.*" The new lock is even stronger and more secure than the original pattern, and the improved methods of manufacture have made it possible for the price to be considerably reduced.

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Wire: "Meters Phone Leeds"

MANCHESTER:
City Meter Works, Port Street
Telephone: No. 6898 City.
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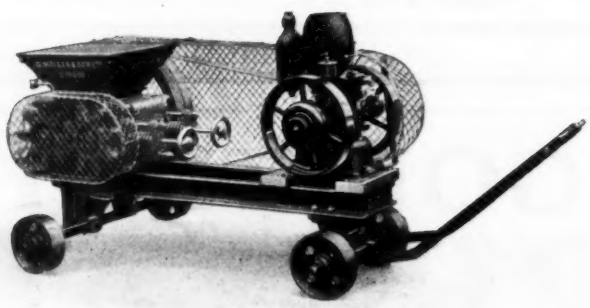
COKE BREAKING



We do not confine ourselves to **large Breakers** for big quantities of Coke, nor to **extra heavy machines** for dealing with **Furnace Coke,** but cover the whole range of requirements.

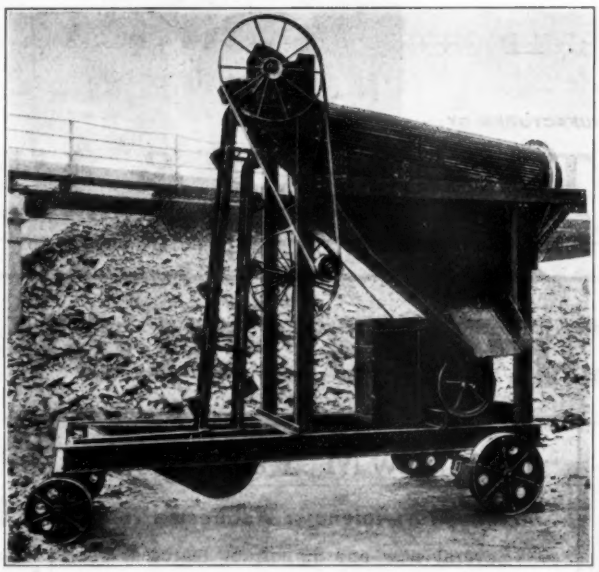
The above block illustrates a very handy little Portable Breaker for 1 to 5 tons per hour with self-contained driving unit, for small Works, and below we show a picture of a Portable Breaking, Elevating and Screening Machine which has been found especially serviceable to meet certain requirements.

Reliability.

Durability.

Cutters scientifically designed. Easily replaced and outlast any other type.

"Phœnix" Machines can be supplied with special **Cutters** for **Oxide Breaking** and **Clinker Breaking.**



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CHAINS

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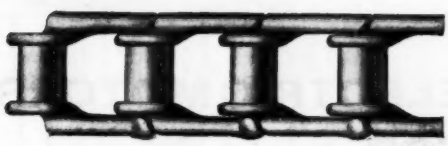
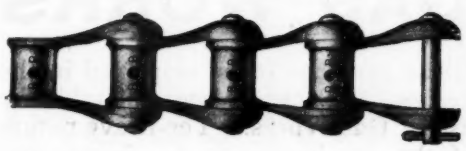
Working loads up to 2,000 lbs. Generally used for light drives. Also for Elevators and Conveyors of light and medium capacity.



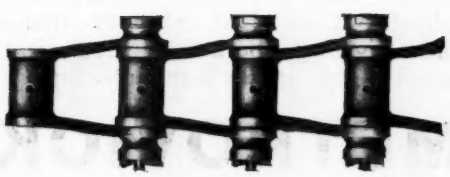
"B.B." PINTLE CHAINS.

Working loads up to 1,000 lbs. Very suitable for light drives; speeds up to 600 feet per minute.



"B.B." GRAY CHAINS.

Working loads up to 3,000 lbs. Are regularly used for drives running not faster than 400 feet per minute, and for Elevators of medium capacity.



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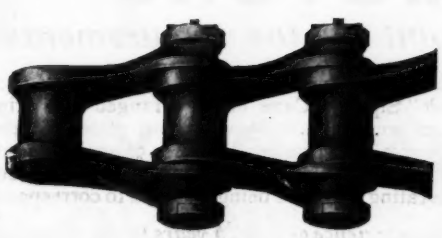
Working loads up to 10,000 lbs. Suitable for large Elevators and slow-speed drives. They are specially recommended where the material to be handled is of an abrasive nature, such as coke.



THE FOUR MOST CURRENT TYPES OF CHAINS USED IN THIS COUNTRY

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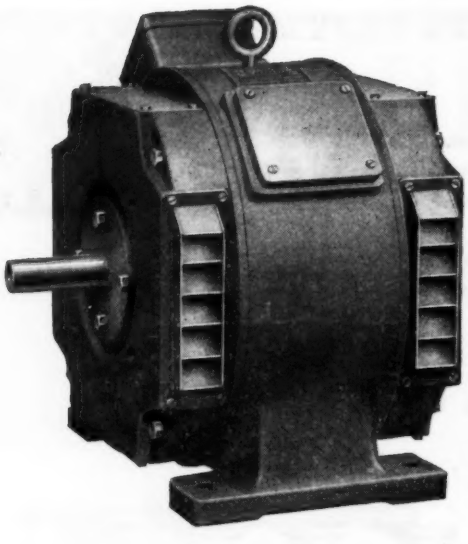

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Great care has to be employed in the design of Electric Motors suitable for use in Gas Works. The heavy nature of the machinery to be driven and the need for slow speeds, calls for motors that are both efficient and robust. Coal dust, sulphur fumes, and high temperatures necessitate unusual care in their manufacture.

METROVICK MOTORS

fulfil all the requirements.

The above illustration shows a typical "Metrovick" Squirrel Cage Motor arranged with drip-proof enclosure. By changing plates on the universal end brackets the form of enclosure can be varied to pipe ventilated or totally enclosed, the rating of course being changed to correspond.

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"PARKINSON" LAMPS

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KAYE'S OIL ECONOMISERS, OIL FEEDERS, &c.

PATTERN No. 4.

OIL CABINETS.

Complete with Pump.

Sizes: 1 Gallon to 100 Gallons.

Painted Red Enamel and lettered to instructions.

"Make the Handling of Oil a Pleasure."

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Sizes: 1 Pint, 2 Pint, and 3 Pint.

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With or without Spouts.

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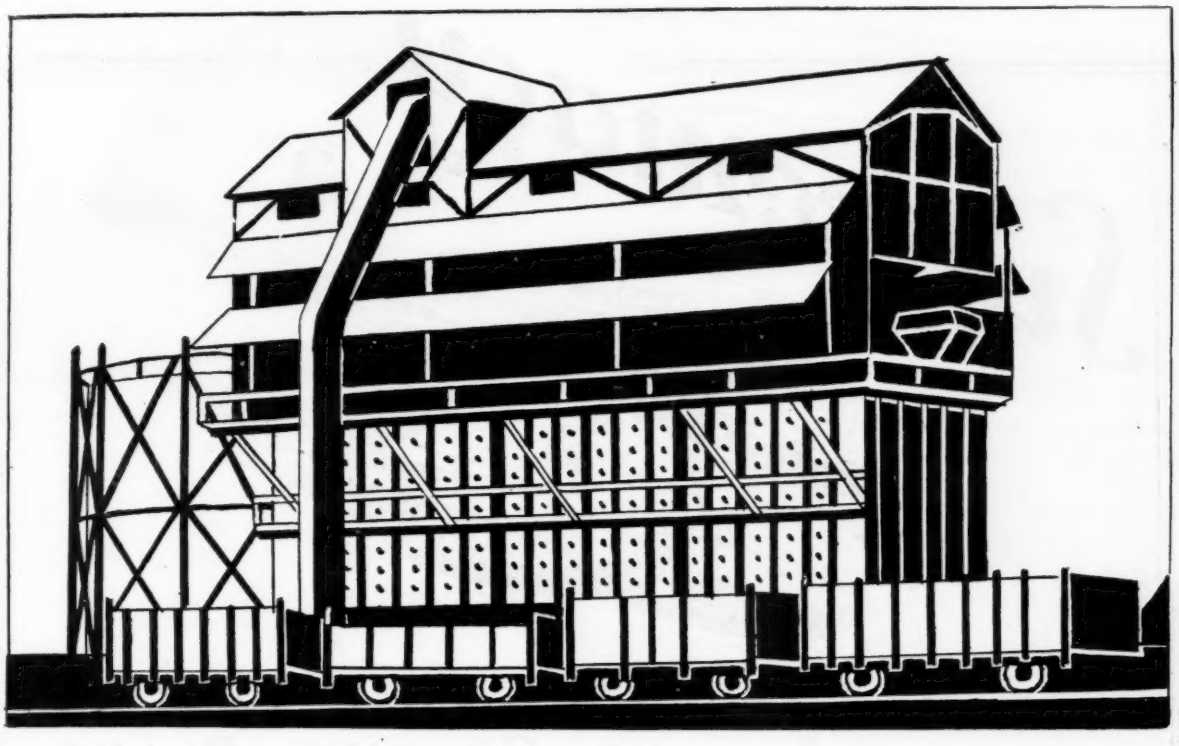

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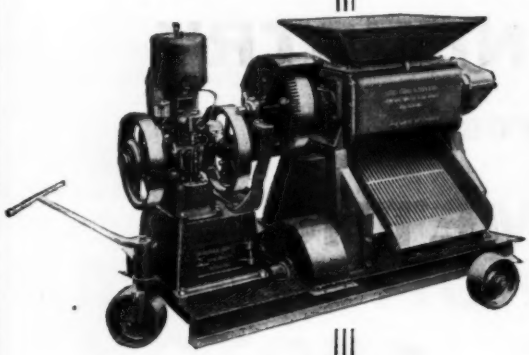
CORT'S COKE CUTTING AND GRADING PLANT

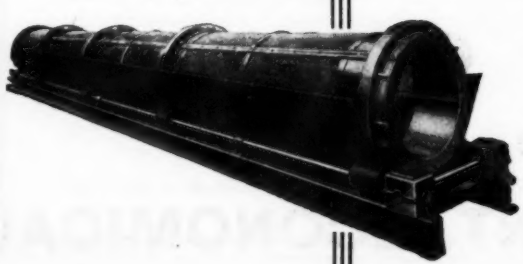


Cort's Coke Cutting and Grading Plant is the outcome of long experience in supplying the requirements of discriminating Engineers. It is

100 °/o VALUE,

not built down to a price, but designed rather to create a standard of quality above competition.

Special attention has been given to the countering of the abrasive and corrosive action of coke wherever it is in contact; thus ensuring the maximum of service at the minimum of Cost for upkeep over long uninterrupted periods.



We appeal to Engineers considering the installation of Coke Handling Plant to bear in mind the foregoing points—and it may be opportune to quote John Ruskin :—

"There is hardly anything in the world that some man cannot make a little worse and sell a little cheaper, and the people who consider price only are this man's lawful prey."

ROBERT CORT & SON, LTD.,
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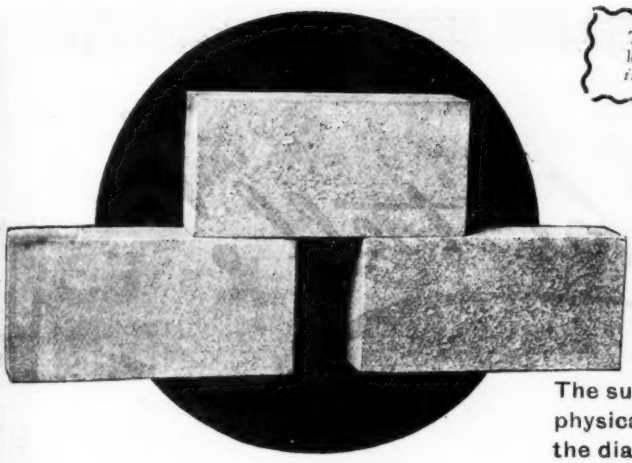
READING

Agents for North of England: Messrs. ROBT. BOWRAN & CO., LTD., 4, St. Nicholas Buildings, Newcastle-on-Tyne.



The most important high-temperature insulating material is kieselguhr or diatomaceous earth.—*J. A. Sugden, Ph.D., in "The Gas Journal," 22/1/30.*

NATIONAL PHYSICAL LABORATORY tests have shown the superiority of Johns-Manville SILOCEL Bricks as high temperature insulating materials—yet these bricks cost less per unit of insulating value than any other materials that will stand equal service conditions.

The superiority of SILOCEL is due to two factors—one physical, the other chemical. Nature has consolidated the diatomaceous rock Celite to a degree that permits SILOCEL Standard Bricks to be cut directly from it and used without the incorporation of a binding agent. This unique feature, together with their exceptionally high silica content, gives SILOCEL Bricks a lower thermal conductivity than any others yet produced.

There are four types of SILOCEL Bricks, to meet a wide variety of structural requirements and a temperature range up to 2500° F., behind the refractory. Each type lasts indefinitely without deterioration at the temperature for which it is specified.

AN INTERESTING ILLUSTRATED BOOKLET

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***Highest* Thermal Efficiency**

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Produces Coal Gas, Water Gas, or Mixed
:: Gas in any desired proportions ::

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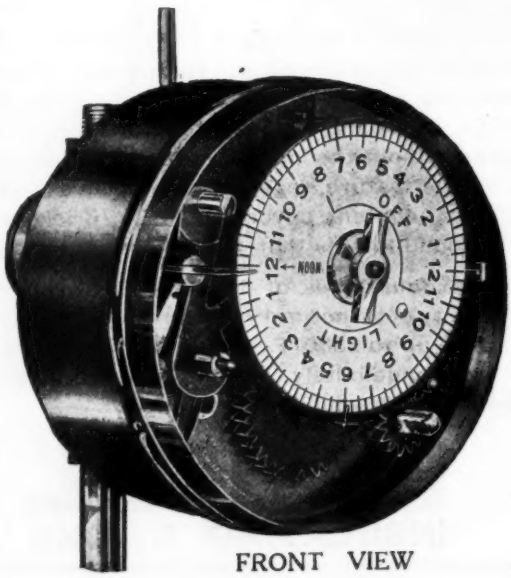

FRONT VIEW

THE ECONOMIES EFFECTED BY INSTALLING

THE LONDON CLOCK CONTROLLER

SOON RECOUP THE INITIAL OUTLAY

BACK VIEW

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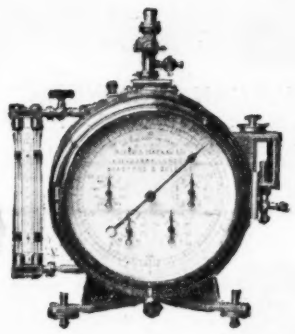

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Street Lamps and Distance Controllers.
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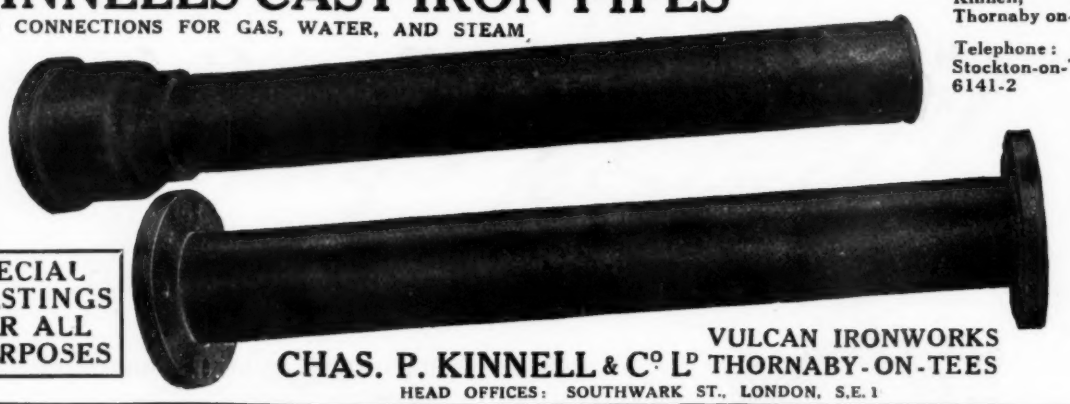

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LOCOMOTIVES of all Sizes and Gauges specially constructed for Main and Branch Lines, Contractors, Docks, Gas-Works, Collieries, Iron-Works, Brick and Cement Works, &c. Locomotives of various Sizes always in progress for early delivery.

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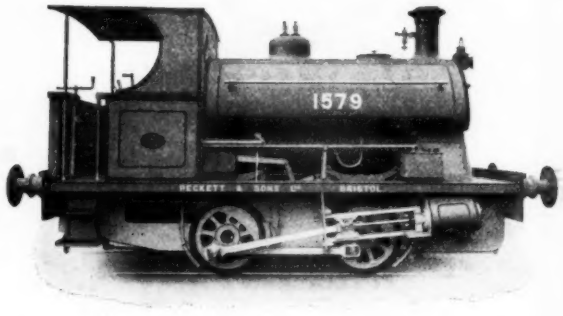
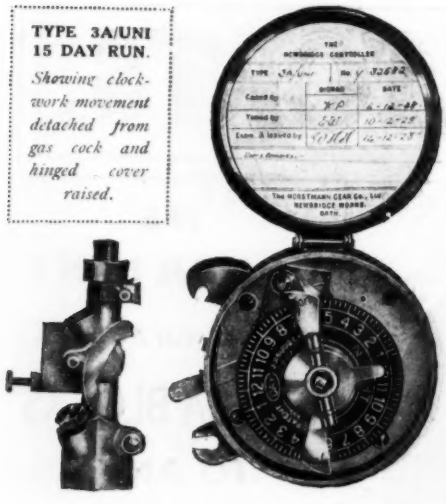


TYPE 3A/UNI 15 DAY RUN.
Showing clock-work movement detached from gas cock and hinged cover raised.



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is the happy comment made by the lamp attendant when referring to winding and setting an installation of NEWBRIDGE Controllers.

With Newbridge Controllers, all adjustments can be carried out at the lamp head with **one hand,** leaving the other free for support, an advantage that ensures greater accuracy in setting and enables the lamp attendant to *complete his round in the minimum of time.*

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The finest insurance for your lighting load

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The
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Packed
GAS WASH BOILER

THE NOTED BLUE BOILER

The Boiler that meets with Gas Engineers' requirements.

Made with double case from the best 22's W.G. Galvanised Steel finished with two coats of Blue Stove enamel, packed with Silicate Cotton. Aluminium cast Top, Pan, Lid, and Condenser made from 12-lb. Rolled Copper. This Boiler, being packed, retains hot water for a number of hours after the gas has been turned off; this is a decided advantage over other boilers. Made in 12, 14, 16, 18, and 20 gallon sizes, if required.

"ECONOMIC" GAS BOILER

GOOD SERVICE and GOODWILL

mean that a consumer will use gas before any other fuel. You can serve your consumers by installing an "Economic" whenever asked for a gas wash boiler. It is efficient, economical, and satisfies the most exacting requirements. Prices for any quantity will be gladly supplied to any gas undertaking.

Let us quote you for

"BEATRICE" GAS COOKER, No. 30.

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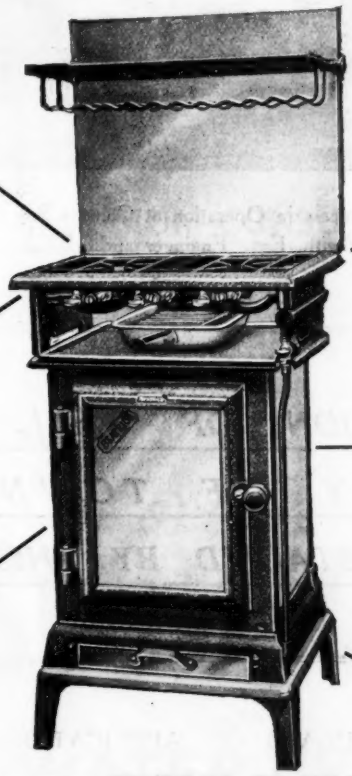
Telegrams: Harpers, Willenhall Oilgas, Cent., London

Patented Flue Outlet ensures EVEN Temperature in all parts of Oven. Patent applied for.

Drilled Ring or Turret Burners in Hot Plate to order.

All Enamel Finish and absence of sharp corners or inaccessible recesses means EASY CLEANING.



Hot Plate Bars in Two Sections ONLY, and each one interchangeable. Cannot be replaced wrongly!

Oven lined with special material giving greater insulation than Slag Wool, with proportionate ECONOMY in GAS consumption.

Oven Burners removed and replaced without difficulty!!

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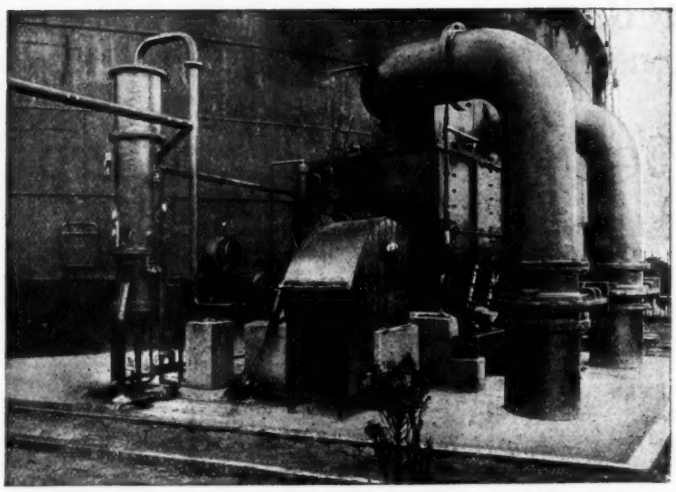
THE "Glycerin" gas drying PROCESS

MAXIMUM DRYING



MINIMUM PLANT

"Glycerin" Process in Operation at Colwyn Bay Gas Works.
J. Smith, Esq., Engineer and Manager.

A REDUCTION OF 75% IN THE HUMIDITY OF TOWN'S GAS CAN BE OBTAINED BY THIS PROCESS

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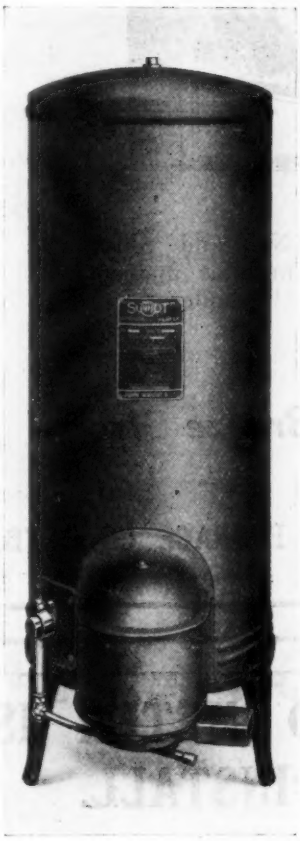
Constant HOT WATER
at a lower cost than ever before



The Sunhot Water Heater provides a constant supply of hot water for all domestic purposes at a surprisingly low cost. Its efficiency has been proved and the Sunhot approved by architects for the Douglas Haig Memorial Homes at Birmingham, Bristol, and elsewhere. Independent tests have also been carried out by Gas Engineers all over the country, and in every case convincing proof has been obtained that the Sunhot is unquestionably the best type of water heater that the gas industry has ever known.

SIX OUTSTANDING FEATURES OF THE SUNHOT:

1. Hot water available at all times.
2. Hot water without attention.
3. Hot water at trifling cost.
   50 gallons of really hot water for 6d. a day, with gas at 3s. 2d. per 1000 cubic feet (500 B.Th.U. per cubic foot).
4. Automatic in operation, and fool-proof.
5. Low cost of installation—no enlarged service pipes or meters.
6. Flue difficulties avoided.

MAXIMUM CONSUMPTION—10 C.F. per hour

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The Sunhot Water Heater is being advertised to the Public throughout the whole country in the leading Daily, Weekly, and Monthly Newspapers and Magazines. Window displays and advertising literature are also available for Gas Undertakings.

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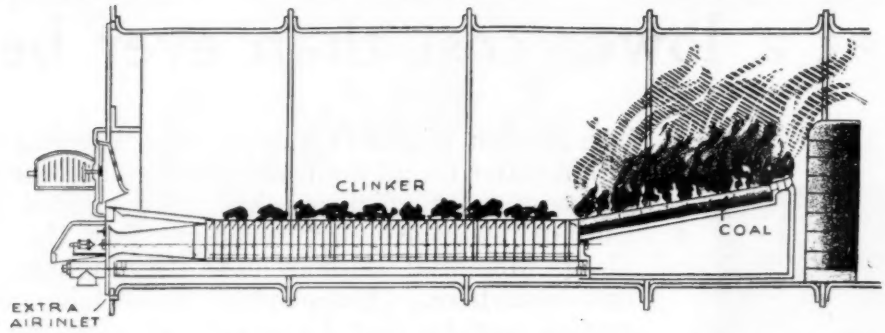
REGULO-CONTROLLED

GAS WATER HEATERS

JOHN WRIGHT & CO., ESSEX WORKS, ASTON, BIRMINGHAM
(Radiation Ltd., Proprietors)

WILTON'S PATENT FORCED DRAUGHT FURNACES



The above diagram shows our SLOPING BLANK END and SMOKE CONSUMER whereby clinkering can be effected in 5 minutes instead of 15 minutes, and cold air is prevented from passing through the boiler, resulting in an increased saving of 10%.

This apparatus renders the furnace capable of satisfactorily

Burning Dust and Fine Coke Breeze from Vertical Retorts.

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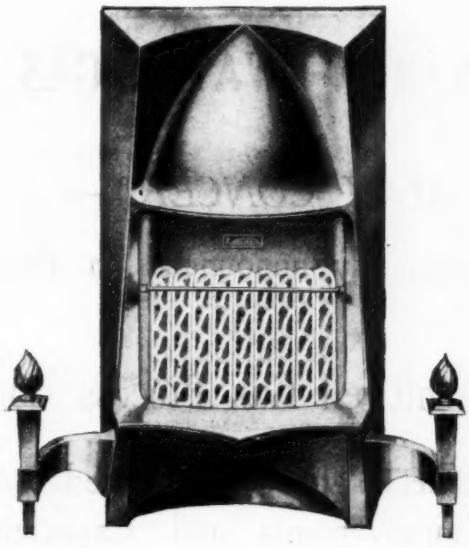

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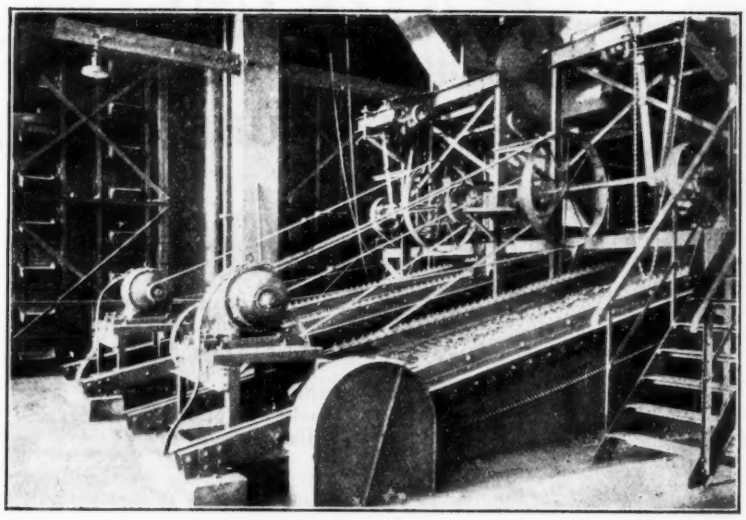

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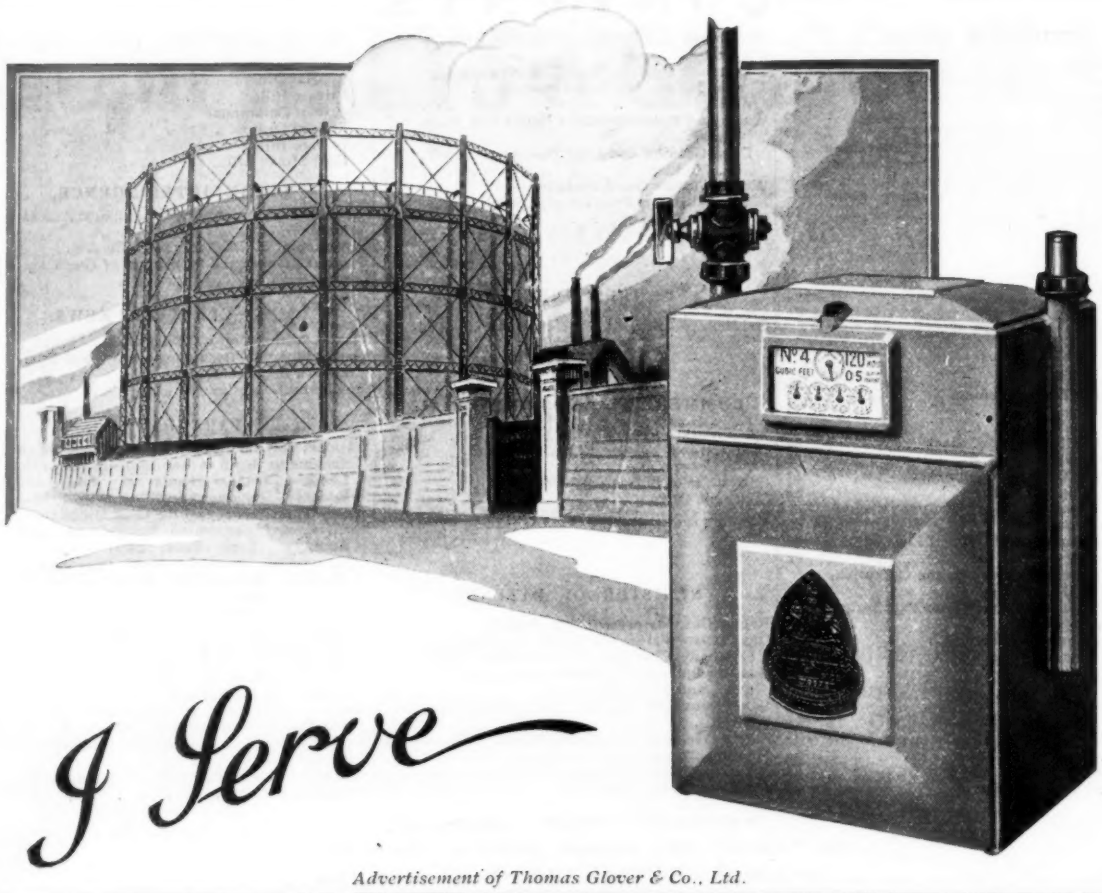

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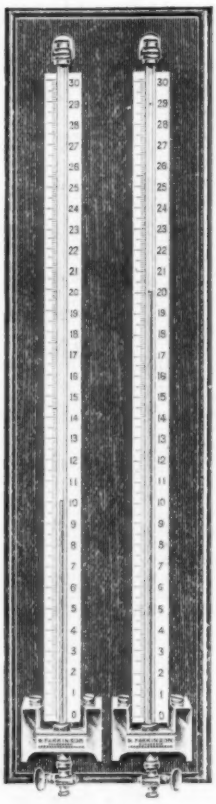

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VOL. CXC. No. 3490.] WEDNESDAY, APRIL 9, 1930. [82ND YEAR.

Editorial Notes.

Science in Industry.

THAT industry needs all the help it can secure is patent to everyone; but it must be the solid help of the "fully-qualified practitioner," and not the airy proposals of the "amateur." The trained scientist, the sound financier, and the experienced business man form a combination that may even command success. How many good businesses have been driven to disaster on the rocks of reckless finance! How many inventors have failed to receive well-deserved reward, through lack of the business instinct! How many sound propositions have fallen lamentably short of justifiable expectations through the absence of that aid which the scientist would have afforded!

What industry owes to science, as well as what science owes to industry, is fairly well appreciated now; but there is still room for the further utilization of the services of that very live member of the community, the chemical engineer. For some time, even the chemical engineers themselves felt it necessary to explain precisely what they were, but now we all wonder how possibly we could ever have done without them. Certain it is that nothing now under existing business conditions could take the place of that triumvirate whose office is the production of highest efficiency and maximum economy—namely, science, industry, and finance. There is a young, but thriving, Institution of Chemical Engineers, which held its annual meeting last week, and at this the President (Mr. J. Arthur Reavell, M.Inst.Mech.E.) cited some of the ways in which science is helping industry. One only of these we will mention here. The President pointed out that enormous wastage takes place by the rusting of iron and steel—the annual amount of this waste being estimated by Sir Robert Hadfield at £500,000,000. This has led to the investigation of iron and steel alloys which will be more resistant to corrosion, and to the production of chromium iron and chromium nickel steels.

Coming to our own industry, we know, of course, how much has already been accomplished by science in the directions of efficiency and economy. One particular instance was, indeed, remarked upon at the dinner which followed the meeting of the Institution of Chemical Engineers, by Dr. F. E. Smith, C.B., C.B.E., F.R.S. (Secretary of the Department of Scientific and Industrial Research), who alluded to the inestimable boon which has been conferred upon the industries concerned, and in an even greater degree upon the community at large, by the introduction of the incandescent gas burner and the gas-filled electric lamp. His estimate of the amount of money saved by the application of these methods of illumination, when compared with the outlay that would have been necessary to secure the same amount of light by means of older types of gas burners and electric lamps, is staggering.

We realize that there is no room for "rule-of-thumb" methods in an age of strenuous competition such as that in which we now live; and the gas industry, while fully acknowledging the great help that it has already received, will look more and more to science for the means of successfully meeting this competition. The combination of science with industry spells research, and research costs money—though little in comparison with the practical results which may be expected from it. In competitive industries there must be obstacles in the way of sharing the results of research; but gas undertakings are not in competition one with another, and therefore collective research presents no difficulties whatever, save only the very minor one of provision of the requisite funds. When the question arises of allocating funds to this collective research, let it always be remembered that money which is devoted to scientific investigation is not an expenditure, but an investment.

High-Temperature Domestic Coke.

THE work of the Liverpool Gas Company on the production of a thoroughly satisfactory domestic fuel by high-temperature carbonization is most encouraging. It commenced three years ago, has been steadily pursued since 1927, and is, we are glad to note, by no means at an end. Those who lack faith in the virtue of continuous research ought to find it in "Dryco"—the concrete result of Liverpool's theory. And this concrete result is no mean one. "Dryco," as the new domestic high-temperature coke has been called, is most popular; there is a waiting-list of consumers, and it has been decided to devote the Eccles Street Works to its manufacture.

Those who wish to learn about "Dryco" should read Mr. J. J. Brown's contribution, "Domestic Fuel by High-Temperature Carbonization," published on later pages of the "JOURNAL" to-day; and they will find it an excellent story. Chapter I. of the investigation at Liverpool is concerned with laboratory tests on blending, carried out largely by Mr. H. H. Thomas, who found that, by the selection of suitable coals, proportions of mixing, and conditions of carbonization, a considerable improvement in the reactivity and structure of the residual coke was obtained. This fact, he concluded, combined with control of the ash and moisture contents of the coke, "will result in the production of a smokeless solid fuel which will burn freely in an open grate" ("JOURNAL," Feb. 22, 1928). What may be termed Chapter II. of the story deals with the procedure, outlined by Mr. Brown, adopted for testing the

properties of various cokes in the domestic grate; as a matter of fact, 36 different cokes, prepared by variations in the blending proportions of swelling and non-swelling coals, in the times of carbonization, and in the temperatures of carbonization, were tested. The results of these small-scale trials fully justified further work being carried out on a works scale under normal conditions; and Chapter III. of the investigation is devoted largely to the effect of grading. It was found that, for a fuel to be satisfactory as regards both ignition and radiation, the coke should pass through 2-in. mesh, and that all coke passing through ½-in. mesh should be rejected.

Chapter IV. commences with the installation of a mixing plant at the Garston Works, and the dry quenching of the coke produced, and both operations are described by Mr. Brown. The dry coke was marketed, and met with immediate approval; within a few weeks the demand was greater than the supply. Tested against a low-temperature coke, "Dryco" proved to give better radiation. The Fuel Research Board gave an excellent report of its qualities; the Smoke Abatement Society found it an admirable fuel; while the Department of the Medical Office of Health of Liverpool are loud in their praises, "optimistically seeing in it the solution of the smoke nuisance from domestic chimneys." This is what Mr. Brown says about it: "We are producing a domestic fuel that "ignites readily with wood and paper, and burns cleanly "and freely. It is entirely smokeless, and burns with a "total absence of decrepitation. The fire is cheerful, "giving flames above the top of the fuel bed, and has a "greater radiant efficiency than domestic coal."

The manufacture of this smokeless domestic fuel has, as the result of this persistent investigation, been simplified and centralized. In "Dryco" Liverpool have set a good example; they have set a still better example by refusing to be complacent about the success which has attended their efforts, as is witnessed by the fact, already mentioned, that they are continuing their experiments to render a good product a still better one. We are sure that Chapter V., still to be written, will prove good reading.

Instructions for Fixing Geysers.

The National Gas Council's booklet on the fixing of geysers, originally published in 1924, has now been issued in revised form, and is obtainable from the British Commercial Gas Association. Recent years have witnessed marked development in our knowledge of the fundamental working of the geyser and its necessary accompaniment the baffler, and this new knowledge has been incorporated in the 1930 edition of this important pamphlet, the contents of which, so clearly set out, should be studied, memorized, and broadcast by all connected with the gas industry.

The geyser is a safe, healthy, and reliable appliance if properly designed and correctly fitted; it has brought the comfort and convenience of a hot water supply to countless homes where otherwise such a supply would be unobtainable. Badly fixed, the geyser is a menace to the community, and the application of the principles laid down in "Instructions for Fixing Geysers" is essential. It is up to us as a public utility service to see that these instructions are carried out to the letter by all builders or outside fitters; if they are, there cannot be the slightest cause for anxiety regarding the functioning of geysers.

It will be noted that there is modification in the position of the baffler. No longer do the illustrations show the baffler fitted as near the ceiling as is possible, for research has shown that no advantage is gained by making the length of primary flue pipe greater than 4 ft. Care should be taken to terminate the secondary flue, carried either through the roof or into a well-ventilated roof space, with a suitable terminal which will, among other things, afford protection against entry of birds—a source of several fatal accidents in the past. Should the secondary flue be carried into the roof space, then the immediate vicinity of the cold water tank should be avoided.

Great stress is very rightly laid on the question of the maximum gas consumption of the geyser. This is an extremely important matter; only the other day investigation into an accident proved that the geyser was set to consume nearly double its rated capacity. There is, as the pamphlet points out, a definite limit to the rate at which gas can be completely consumed by it, and that above a critical limit combustion will be incomplete. The gas rate corresponding to the normal working capacity of a geyser should not exceed 80 p.ct. of the maximum safe rate. This should invariably be tested when a geyser is being installed. No good purpose would be served if we reiterated the instructions in the pamphlet, which we regard as inflexible, but we might well emphasize one single factor in installation which we know from experience is apt to be overlooked—where geysers are fitted on a solid shelf, care should be taken to see that sufficient opening is left at the base of the geyser for the free admission of air.

A Peculiar Case.

On one or two occasions lately, we have had cause to wonder what exactly is the purpose with which some of the newspaper article headings are written. They do not always inform accurately. Again, sometimes they are long, and at others they are short; sometimes they are in big capital letters, and at others in small. And so far as one is able to judge, this length and this size are not invariably in exact proportion to the importance of the item of news which is thus heralded. All that is a pity, because the best heading must be the one which is most helpful in every respect to the reader; and the worst, one which, however accidentally, may convey at first glance a wrong impression.

These remarks are suggested once again by a newspaper cutting referring to a double fatality which occurred a few weeks ago on a farm in Scotland. The article is headed "Coal-Gas Poisoning," and gives an account of an inquiry into the circumstances attending the deaths of two young farm servants, who lost their lives as the result of carbon monoxide poisoning while asleep in the men servants' sleeping apartment at a farm. The tragedy was due to the defective vent of a stove, and the Jury expressed the opinion that negligence was attributable to the farmer's son, who superintended the place for his father, in not taking the necessary steps to keep the vent clear. He had, it seems, told the youths to put the fire out, and that he would see to the matter next morning. The newspaper account goes on to explain, with regard to the stove, that "the vent became choked, and when "the coal fire was lit smoke and fumes pervaded the sleeping apartment."

Now, without any desire to quibble, we would respectfully suggest that the heading "Coal-Gas Poisoning," would not give the average reader a correct idea of the circumstances attending the case reported. When noting the immense amount of space that is devoted by the lay Press to our friends the electricians, there is sometimes a disposition to regard the amount of publicity extended to the gas industry as being a trifle meagre, but there is no desire to have any extension of the sort of thing which is referred to here.

Lewisham Street Lighting Tests.

Interest continues to be taken in the street lighting tests at Lewisham, where, as mentioned previously in the "Journal," there are two modern installations of gas and electric lighting on adjacent mile stretches of the Hastings Road, the South Metropolitan Gas Company being responsible for the gas lighting, and the South Metropolitan Electric Light and Power Company for the electric. The Lewisham Borough Council are expected to give a decision to-morrow as to which they intend to adopt for a further fifteen miles of the highway. Already visits from the Minister of Transport, from well-known motorists, and from authorities responsible for the lighting of the new arterial roads under construction in Midland Counties have been made to the district, and many opinions favourable to gas have been expressed.

A Motorist's Idea of the Results.

Earl Howe, better known to Brooklands enthusiasts as Viscount Curzon, states that the contrast between the siting of the two systems is very marked. "Whereas," he said, "the gas light suspended over the centre of the roadway gives a perfectly safe and almost ideal light, from the point of view of all road-users, who are easily able to detect approaching vehicles, even if those vehicles are inadequately lit themselves, the diagonal siting of the electric installation results in pools of light alternating with shadows, the darkness of which seems to be almost accentuated by the belt of light immediately underneath the lamp. The light itself does not appear to be nearly so well diffused as in the case of the lamps suspended over the centre of the roadway. I am of opinion that under bad conditions, or in fog, there would be no two opinions between drivers as to which system of lighting was the better, quite irrespective of the rival merits of electricity and gas. In fog, the line of lights suspended over the centre of the roadway at regular intervals would enable any driver to know exactly where he was and to preserve his sense of direction. With lights diagonally spaced, this would be absolutely impossible, and the only chance for the driver would be to follow the tramlines or kerb."

Something Like an Increase in Sales.

We have read with much satisfaction the remarks of Mr. R. V. Elvey, Chairman of the Slough Gas Company, to the proprietors at the annual general meeting. During 1929, a record in gas sales was established, the increase over the previous year being a matter of 15·3 p.ct., with 425 additional consumers. "If they looked back over the four years 1926-29," observed Mr. Elvey, "they had the almost startling fact that the business of the Company had increased by no less than 55 p.ct." This is an increase which emphasizes the vitality of our industry.

Retrenchment Vital to Prosperity.

The opinion so frequently expressed in these pages, and in many other quarters, that there is a connection between the lack of economy in the national expenditure and the present unsatisfactory economic position of the country, seems to receive support in an address delivered at a meeting of the Incorporated Accountants' Students' Society by Mr. Arthur Kiddy, who said that the "first and most obvious point, arising from an examination of the national accounts, was the fact that ten years after the armistice the increase in expenditure for the year 1928-29 was infinitely greater than could be accounted for by the rise in the price of commodities, plus the special and inevitable expenditure arising out of the war. These brought the pre-war total annual expenditure of £200,000,000 to a total of £678,000,000. As a matter of fact, the expenditure for the year was over £800,000,000, showing that heavy new expenditure in certain directions had been incurred. True, the revenue had also expanded, but mainly as the result of heavy taxation. Quite apart, therefore, from the character of the expenditure, it would seem that the great increase in outlays met by heavy taxation must be carefully noted when considering the causes responsible for the present depression. . . . Any body of chartered or incorporated accountants examining the national accounts would not be long in forming the conclusion that in the combined total represented by the income-tax, super-tax, and death duties, there was a force sapping the resources of industry to a dangerous extent, and possibly accounting to some degree for the present severity of industrial depression."

Our Crushing Burden.

Some idea of the nature of the handicap placed upon this country in competing with others will be gathered from figures quoted recently, in answer to a question, by the Chancellor of the Exchequer. From these it is gathered that the figures of national taxation per head of the population for the year 1929-1930 are £15 1s. 5d. for the United Kingdom, £9 12s. 8d. for Germany, and £8 14s. 3d. for the United States. These figures include an estimated amount for the year named to cover the taxation levied in the German States and in the States of the American Union. What do our great political parties intend to do about it? It is obviously time that the matter was seriously considered.

Money for Industry.

Meanwhile, we learn from the "Financial Times" that negotiations are still proceeding for the formation of a £6,000,000 Company to provide money for industry. Presumably this is the same industry that is being suffocated by the weight of taxation imposed upon it. At present the proposals are tentative, but our contemporary has reason to believe that the capital named is to be divided into "A" and "B" shares of £100,000 each. The "A" shares (which will number three-quarters of the whole) are to be taken up by the banks and issuing houses, while the Securities Management Trust, which was formed last November under the auspices of the Bank of England, will subscribe for the "B" shares. The two classes of shares will carry different voting powers. It is proposed that Regional Advisory Councils should be established in different parts of the country which would advise the Board regarding industrial requirements in their respective areas. Invitations are to be extended to economists to approach the Board with any suggestions they have to submit. The comment in City circles seems to be that were the capital ten times as much, it would still be insufficient.

A Voluntary Four-Part Tariff at Burnley.

In later columns will be found the terms of a voluntary four-part system of charging for gas for industrial or trade purposes which has been adopted by the Burnley Town Council. The method of charge is composed of a customer charge, a manufacturing demand charge, a distribution demand charge, and a commodity charge. The Gas Department have laid a main, seven miles long, for the purchase of crude coke oven gas, and our readers will note with interest that supplies of this are offered for industrial purposes to customers along the route of the main at 2½d. per therm commodity charge—¾d. less than the commodity charge for purified town gas.

Forthcoming Engagements.

April 10.—Society of British Gas Industries—Council Meeting.
April 11.—North British Association of Gas Managers.—Spring Meeting at Helensburgh.
April 11.—British Commercial Gas Association.—Annual Meeting of Salesmen's Circles, Caxton Hall, Westminster.
April 12.—Yorkshire Junior Gas Association.—Visit to Messrs. Low-Temperature Carbonisation, Ltd., Askern Main Works, Doncaster.
April 17.—Midland Junior Gas Association.—Meeting in the Council House, Birmingham. Paper by Mr. J. H. Willis, A.M.I.Mech.E., of the Waterless Gasholder Company, on "Waterless Gasholders."
April 23.—Southern Association of Gas Engineers and Managers (Eastern District).—Meeting at 28, Grosvenor Gardens, S.W. 1, 2.30 p.m.
April 26.—Western Junior Gas Association.—President's Day. Visit to the Weston-super-Mare Gas-Works, and Annual Meeting.
April 28.—Wales and Monmouthshire Junior Gas Association.—Annual General Meeting at Newport.
May 2.—North of England Gas Managers' Association.—Annual General Meeting in Newcastle.
May 2.—British Commercial Gas Association.—Scottish District Conference, Ayr.
May 9.—Southern Association of Gas Engineers and Managers.—Visit to Eastbourne.
May 9.—British Commercial Gas Association.—Midlands District Conference, Malvern.
May 13.—British Commercial Gas Association.—Executive Committee Meeting, London, 2.30 p.m.
May 16.—Eastern Counties Gas Managers' Association.—Spring Meeting at Harwich.
May 16.—Society of British Gas Industries.—Annual General Meeting and Dinner, Hotel Metropole, London.
May 21.—British Commercial Gas Association.—General Committee Meeting, London, 2.30 p.m.
May 23.—British Commercial Gas Association.—Lancashire District Conference, Morecambe.
May 27.—National Gas Council.—Annual Meeting.
June 2-5.—Institution of Gas Engineers.—Annual Conference in Leeds.

Personal.

The Moulton Medal for 1929 has been awarded by the Institution of Chemical Engineers for the paper on "The Recovery of Benzole from Coal Gas, with particular reference to the Use of Active Charcoal," by H. Hollings, S. Pexton, and R. Chaplin.

Mr. Edward Garsed, former Hon. Secretary of the Yorkshire Junior Gas Association, who left England for India on Christmas Eve, 1919, to become Chief Accountant to the Oriental Gas Company, Calcutta, has been appointed General Manager of that undertaking, in succession to Mr. L. M. Snelgrove, who is retiring after twenty years in that position. Both are West Yorkshiremen, Mr. Snelgrove a native of Bradford and Mr. Garsed of Elland. Mr. Garsed was trained by the late Mr. Robert Porter (Manager to the Elland-cum-Greetland Gas Company for many years), and after a period as Manager and Secretary of the Kippax Gas Company he became Assistant Manager of the Elland-cum-Greetland Gas Company.

Mr. C. H. Lane, West of England and Wales Representative of Messrs. Robert Cort & Son, Ltd., of Reading, was elected an Associate Member of the Institution of Mechanical Engineers on Feb. 21. He obtained his present appointment after over twenty years' experience on gas-works, including Birmingham, Bournemouth, Bath, Jersey, and Weymouth, following an apprenticeship with Messrs. Baldwin, Ltd., South Wales.

Formerly Gas Manager at Kilmaurs, Mr. James Young has been appointed to a similar position at Dingwall.

Mr. David Martin, formerly Representative for Messrs. Milnes' Meters, Ltd., has joined the staff of Messrs. Sawer & Purves, and will represent them in conjunction with their Senior Representative, Mr. Mackenzie, in the Midland area.

The following have recently been elected to Membership of the Institution of Chemical Engineers: Mr. T. C. Finlayson, M.Sc., the Woodall-Duckham Companies; Mr. R. O. Newton, Coking and Bye-Product Works, Randolph Colliery, Evenwood. The following are new Associate Members: Mr. W. A. Barnett, Barnet District Gas and Water Company; Mr. S. G. Watson, M.Sc., W. C. Holmes & Co., Ltd.

Mr. H. Penn, a Junior Assistant at the Foleshill Works of the Coventry Gas Department, has been appointed a Junior Works Engineer at the Rio de Janeiro Gas-Works. At a gathering of the staff of the Department, Mr. C. F. Tooby, Works Manager, on behalf of the staff, presented him with a set of technical books, and wished him success in his new venture.

Mr. J. P. C. Handy, a junior member on the Staff of Mr. W. E. Dean, the Engineer to the Exmouth Gas Company, was recently presented with a case of drawing instruments from the Directors of the Company, also a silver watch from the Staff and employees, on his leaving Exmouth to take up an appointment as Junior Works Engineer to the Rio de Janeiro Tramways, Light, and Power Company. In making the presentation on behalf of the subscribers, Mr. Dean conveyed to the recipient their best wishes for his future, and stated that his career would be watched by those with whom he had been associated at the Exmouth Works during the past seven years. Mr. Handy, in thanking the subscribers for their useful gifts, assured them that the time spent at Exmouth had enabled him to acquire sound technical knowledge of gas manufacture, and this had assisted him in securing the post he was about to occupy. He was now leaving to put that knowledge to the test in a more responsible position.

Sir Lawrence Weaver, K.B.E., left £30,738 (net £28,263).

Obituary.

THE LATE MR. JAMES W. SLACK.

An Appreciation by Walter T. Dunn.

When attending the Council meeting of the Chartered Institute of Secretaries on April 1, I, in common with all my colleagues, was grieved to learn of the passing of James William Slack, who ably filled the office of President of the Institute in the year 1924-25. Through my work on the Council of the Institute and its various Committees I was brought into close contact with Mr. Slack, and had known him previously on account of his having been Secretary to the Tunbridge Wells Gas Company, a position which, when he vacated it, was taken by my predecessor as Secretary of the Gas Institute—the late Mr. F. F. Burfield.

Mr. Slack earned the esteem of all his colleagues, and took the deepest interest in all the many organizations with which he was long associated. His kindly disposition will remain a precious memory to all who had the privilege of working with him. As an indication of the high regard in which he was held by the Chartered Institute of Secretaries, the following resolution, which was passed by the Council on hearing of his demise, may be quoted:

> That the Council record their deep sorrow on the death of James William Slack, their esteemed colleague for the past twenty years on the Council of the Institute, and President in 1924-25, whose ripe and sympathetic judgment, as well as his benevolence to the fund for aiding necessitous members and their dependants and his endowment for the encouragement of students, will, in conjunction with his gift of the heraldic sign at the Institute Hall, remain a cherished memory of his interest in the welfare of his profession; and that a heartfelt expression of sympathy be conveyed to his widow and family in their loss.

The death has taken place of Mr. John Letham, Manager of the Leslie (Fife) Gas-Works, at the age of 49 years.

Mr. Arthur Richard Ansell, the Secretary of the Bewdley Gas Company, was last week found dead in his chair in his office.

At the age of 91, the death is announced at Long Sutton (Lincs.) of Mr. Samuel Septimus Mossop, a well-known local solicitor, who held the post of Secretary to the Sutton Bridge Gas Company for 66 years. He was appointed in 1864, and only retired from active association with the Company in 1928, when he was one of the oldest practising solicitors in England.

The death has occurred of Alderman J. C. Purser, Chairman of the Warwick Gas Company since 1921. Mr. Purser had been a Director of the Company since 1913, and as Chairman he was often seen at the meetings of the National Gas Council and the British Commercial Gas Association. Deceased was a very active member of the Warwick Town Council for many years, and was Mayor in 1907, 1908, and 1909.

Col. David Laidlaw, V.D., T.D., of Beechwood, Skelmorlie, who died on March 24 in a Glasgow Nursing Home, was a member of one of the oldest families connected with the gas industry. Colonel Laidlaw was Chairman of Messrs. R. Laidlaw & Son (Edin.), Ltd., Simon Square Works, Edinburgh, and also a Director of the Tuscan Gas Company, Ltd. Deceased was 68 years of age, and was one of the best known Territorial Officers in the West of Scotland. Prior to the war, he had a long record in the Volunteer movement, and on the outbreak of hostilities he offered his services, and was given command of the 16th Battalion H.L.I. After training at home, the Battalion went to France under his command, where he was wounded in action. He had the distinction of being mentioned in despatches. He is survived by three sons and two daughters.

Correspondence.

[*We are not responsible for opinions expressed by Correspondents.*]

Oxide Purification.

Sir,—Since you have thrown open your columns to a rather unusual form of advertising, you will, no doubt, out of a sense of fairness, allow me to say something on the subject of highly active artificial oxides. There are two points which puzzle me, and I will put them in the form of simple questions which Mr. Hutchinson may care to answer.

1. Suppliers of natural bog ores and oxides are up against the question of moisture content, and, although much work has been done, it has been shown to be uneconomical artificially to dry a natural ore. But an artificial oxide is a bye-product which can be readily and cheaply obtained in a dry, or nearly dry, form. Why, then, is "Lux" so often found to contain nearly, if not quite, as much free moisture as the natural ores?

2. A gas engineer buys some artificial oxide—say, "Lux"—and fills one of his boxes with it. He then forgets all about it for five years; at the end of this time it occurs to him that some time during the next year or so he will have to change that box. Now the material "after one fouling" will contain "up to 50 p.ct. of sulphur," and the question therefore is: Shall he send for the fire engine before the cover is removed, or shall he take a sporting chance and rely on the foreman's initiative?

On re-reading Mr. Hutchinson's letter, I see he states that "the material after one fouling can be discarded, so that revivification outside the purifiers is entirely obviated." This leads to just one more tiresome question—namely, how to empty a box of freshly fouled oxide in the presence of air, and prevent, or "obviate," revivification?

H. R. Hill,
London Manager and Chemist.

The British Gas Purifying Materials Company, Ltd.,
226, Bishopsgate, London, E.C. 2,
April 7, 1930.

In To-Day's "Journal."

Carbonization in Glover-West Verticals.

Messrs. West's Gas Improvement Company, Ltd., have issued a book dealing with this subject, and a notice of this work is published. In this it is stated that the volume as a whole represents an enterprising attempt to tell a complete story of the capabilities of a modern and popular form of gas-works practice; and certainly those who have been responsible for it have not failed in their endeavour to provide gas engineers of all opinions with a highly valuable and unusual addition to their libraries.

* * * *

Domestic Fuel by High-Temperature Carbonization.

For several years now the Liverpool Gas Company have carried out extensive investigational work, both in the laboratory and on a large scale, on the production of a thoroughly satisfactory domestic coke by high-temperature carbonization. Mr. J. J. Brown, who is on the staff of the Company, outlined a good deal of this work in a paper before the Manchester and District Junior Gas Association, of which contribution an extract is published. By careful blending of the coals prior to carbonization, and by dry quenching of the coke produced, they are able to manufacture a domestic fuel, known as "Dryco," for which there is a great demand. Here is what the author says towards the end of his paper: "The fuel has become very popular in Liverpool with the people fortunate enough to procure supplies, for, working as we are with restricted plant, the quantities available are small. There is a waiting list of consumers, most of whom are impatient, and we cannot keep up with the demand. It has now been decided to manufacture 'Dryco' exclusively at our Eccles Street Works, which at present are carbonizing 130 tons of coal per day. . . . In 'Dryco' we are producing a domestic fuel that ignites readily with wood and paper, and burns cleanly and freely."

* * * *

Vertical Retort Practice on a Small Works.

This was the subject of a paper by Mr. S. B. Jones, of Clevedon, before the Western Junior Gas Association. He makes particular reference to coal testing under normal working conditions. "In my opinion," he says, "the obtaining of information as to the yields of gas and bye-products from a coal, with any degree of accuracy, is only possible under actual working conditions; and in order to compare various coals and to obtain reliable data for making valuations for contracting purposes, it has been our practice for the last few years to make tests under these conditions of any new coals offered to us before fixing contracts, carefully noting (in addition to the usual test figures, make per ton and per retort, &c.) all working conditions of the plant, and the characteristics and behaviour of the coal and the bye-products. Our tests are generally carried out during the summer months when we have only one bed of four retorts in action; and as we have no other gas making plant, such as water gas, we utilize the whole of our plant for the test—a condition which cannot be obtained on many works."

* * * *

Standard Shatter Test for Coke.

The Midland, Northern, and Scottish Coke Research Committee of the Iron and Steel Industrial Research Council have adopted and advocate a standard method for the shatter test of coke. The apparatus is described and illustrated, and the procedure given.

* * * *

"Instructions for Fixing Geysers," 1930.

In 1924 a pamphlet entitled "Instructions for Fixing Geysers" was compiled under the authority of the National Gas Council and published by the British Commercial Gas Association. During the last few years important new facts have been brought to light by the research work and experiences of gas undertakings and others. The fresh information has been incorporated in a revised booklet of instructions just issued, compiled after consultation with officials of the Ministry of Health.

* * * *

Coke Grading and Coal Blending.

Mr. T. H. Madden, of the Cardiff Gas Light and Coke Company, deals with this subject in a paper before the Wales and Monmouthshire Junior Gas Association. He explains how attention to grading and screening has improved domestic coke sales in the Company's area, and speaks of the value of having able commercial coke salesmen, to advise consumers as to the possibilities of this smokeless fuel. At the Grangetown Works, coal testing is carried out day by day in a small test plant which comprises one bed of three horizontal stop-end retorts, each capable of carbonizing 1 cwt. charges per diem, under exactly similar conditions to those prevailing in the retort houses. All coals are regularly tested in this plant, while thorough tests are made of the gas, coke, tar, &c. From these tests considerable knowledge is gained of the cokes produced.

Tenders for Colchester Stock Issue.—Tenders for the £15,000 6 p.ct. preference stock which were offered by A. & W. Richards, of 37, Walbrook, E.C. 4, on behalf of the Directors of the Colchester Gas Company, were opened on April 3, the prices ranging from £105 per £100 down to the minimum of par. The average price obtained was £100 10s. 5d. p.ct.

£8000 Scheme to Begin at Stamford.—It is announced that the Stamford Gas Company are to proceed with the erection of a 250,000 c.ft. capacity gasholder in a steel tank upon a reinforced concrete raft foundation. The scheme is being carried out under the Development (Loan, Guarantees and Grants) Act, 1929. The site for the new holder is at the bottom of Gas Street, Stamford, adjacent to the river and the Gas-Works, upon land belonging to the Company and scheduled by Parliament for such purposes. The contract has been settled, and the work, which will take approximately nine months to complete, will begin almost immediately.

Inquiry into Leeds Deficit.—A special meeting of the Leeds Corporation Gas Committee was held on April 1 to consider the position created by the deficit of nearly £60,000 on the working of the year ended March 31. The deficiency is accounted for chiefly by reduced gas sales. The Committee, after hearing a report by the Engineer and General Manager (Mr. C. S. Shapley), appointed a special Sub-Committee to investigate further. Meanwhile, the Gas Committee have submitted for the consideration of the City Council two resolutions: (*a*) That the Chairman (Councillor E. J. Clarke), the Deputy-Chairman (Alderman James Noon), Alderman G. Ratcliffe (former Chairman), and Councillor Graham Ford be a Sub-Committee to confer with such members as may be appointed by the Electricity Committee to consider possibilities of co-ordinating the gas and electricity services of the city so as to avoid cut-throat competition between the two Departments; and (*b*) that the Engineer and General Manager (Mr. Shapley) obtain information from other undertakings as to the effects on the gas industry of the operation of assisted electricity wiring schemes.

Floods at Tiverton.—A storm, described as the worst experienced locally for many years, broke over Tiverton on Saturday afternoon. There was extensive flooding, which involved the Corporation Gas and Electricity Works. The town was in darkness for many hours.

Cookery Demonstrations at Wakefield.—Under the auspices of the Wakefield Gaslight Company a series of gas cookery lectures was given at the Musical Union Rooms, Wakefield, from March 31 to April 4, inclusive, both day and evening, the lecturer being Miss I. W. Sketchley, M.C.A., of Hornsey. The cookers used in the demonstrations, of the most up-to-date, automatically-controlled, type, were supplied by General Gas Appliances, Ltd., of Manchester. A public cake-baking competition was promoted during the week.

Bradford Council and the Coal Mines Bill.—The leader of the Conservative Party in the Bradford City Council (Alderman Lieut.-Col. A. Gadie) has tabled the following resolution for the next City Council meeting: "That this Council views with apprehension the effect which the proposals contained in the Coal Mines Bill are likely to have on municipal undertakings, on the ground that the increased cost of coal will result in increased charges to consumers of gas and electricity, with a consequent diminution in the demand for electric drive in factories and for gas and electric fires in private houses, as a result of which the health of the community is likely to suffer by reason of the continued use of boiler furnaces and coal fires, and the consequent continuance of the serious pollution of the atmosphere. That, in addition to the foregoing, there are not sufficient safeguards in favour of gas and electricity undertakings against undue or unreasonable prejudice or disadvantage in connection with the sale or supply of coal to such undertakings." It is likely that this proposition will create a hot political debate, in view of the fact that the City Council recently, on a Socialist majority of those present, approved a Gas Committee resolution (also Socialist-prompted) favouring the Coal Mines Bill and urging the Government to introduce legislation for municipal retail coal distribution.

Commercial and Industrial.

Stock Market Report.

[For Stock and Share List, see later page.]

Gas stocks and shares continued in good demand last week; and it will be seen by reference to the Stock and Share List that prices in many instances hardened in consequence. The bulk of the business centred round Gas Light £1 units, which increased a further 1¼d. to 19s. 3d.; the European £10 shares, which rose 1¾ points to 15; and the Imperial Continental capital stock, which was marked up 15 points to 305. The latter stock changed hands at as high as 401 against 385, the top price for the previous week. Other ordinary stocks to record increases in value were Croydon sliding-scale 1 point to 105½, and South Metropolitan 1½ to 100½. A few debenture stocks hardened, the principal of which was Imperial Continental 3½ p.ct. with a rise of 7½ points to 80. Bournemouth 3 p.ct. and 4 p.ct. increased 2 points each to 56½ and 75½ respectively, and South Metropolitan 3 p.ct. gained 1 to 59½. Apart from *ex* div. reductions, the only fall last week was a slight drop of 1½d. in Newcastle £1 units on the local Exchange.

There are several 5 p.ct. maximum stocks in the List which merit attention as potential investments, and, having regard to the fact that the security offered is about comparable in most cases, the wide range in the prices is rather remarkable. Among these are the following:

—	Present Price.	Yield. P.Ct. P.A.
		£ s. d.
Aldershot	75½	6 12 5
Bristol	88	5 13 7
Croydon	84½	5 18 4
East Hull	71½	6 19 10
Northampton	75½	6 12 5
Portsmouth	79½	6 5 9
Southampton	77½	6 9 0

Particulars of two issues of stock have been received—viz., the Slough Gas Company, which is offering for sale by tender £30,000 ordinary stock at a minimum price of par and £2000 5 p.ct. perpetual debenture stock at a minimum of £97 10s. p.ct., and an issue by the Colchester Gas Company of £15,000 6 p.ct. irredeemable preference stock also at a minimum of par.

Coal Markets.

There are no signs of any improvement to record, and reports from all districts are unsatisfactory. Export trade is extremely quiet, and buyers are still holding off, and even in many cases asking for postponement of shipments when coal has already been bought. Stocks everywhere remain exceptionally high.

While collieries are making efforts to resist any further price reductions, there is a weak tendency, especially in second-class qualities. In the Durham gas market, Wear specials are nominally 16s. 9d. to 17s. f.o.b., but a sale for this month to Palermo is reported to have been made at 16s. 4d. c.i.f. Best qualities are quoted at 16s. f.o.b.; best seconds are weak at 13s. 6d. to 14s. Coking, too, is easy at 13s. 6d. to 14s.

Yorkshire and Midland reports of industrial coal are fairly good, but export demand is at a very low ebb, with supplies well in excess of demand. The fall in values has, however, to some extent been arrested. The official export quotation for screened gas coal is 15s. 9d. to 16s. 6d.

Gas coke is rather steadier for choice, though the value appears to be unchanged at about 21s. in most districts.

Trade Notes.

Pneumatic Gas Lighting Company, Ltd.

This firm have removed from 36, Farringdon Street, E.C., to 39, Farringdon Road, E.C. 1.

Metropolitan-Vickers' Birmingham Office.

As from April 14, the Birmingham address of Messrs. Metropolitan-Vickers Company, Ltd., will be "Wellington House," 39, Bennett's Hill, Birmingham. Telephone: Central 2801 and 2802. Telegraphic Address: "Multiphase, Birmingham," as before.

A New Cannon Cooker Showcard.

A new showcard recently produced by Cannon Iron Foundries, Ltd., of Deepfields, near Bilston, Staffs., which is suitable for gas showroom displays, portrays, in eight colours, one of the firm's latest gas cookers, complete with automatic oven control and plate rack, embodying a mottled enamel finish of an attractive appearance.

"W-D" Verticals for Granton Gas-Works.

The tender of the Woodall-Duckham Vertical Retort and Oven Construction Company for the construction of vertical retorts at the Granton Gas-Works has been recommended by the Gas Committee to the Edinburgh Corporation for acceptance. Work is to start within four months, and is to be completed within fifteen months from the commencement.

Current Sales of Gas Products.

The London Market for Tar, Tar Products, and Sulphate.

London, *April* 7.

Prices for tar products remain unchanged.

Creosote for export is 6d. to 6¼d. per gallon f.o.b.

Pitch is 47s. 6d. per ton f.o.b.

Pure toluole is 2s. 5d. to 2s. 6d.; solvent naphtha, 95/160, about 1s. 5d.; pure benzole, about 1s. 11d.; and pyridine bases, 3s. 9d.—all per gallon.

Tar Products in the Provinces.

April 8.

Markets for tar products generally are quiet, but the undertone is quite firm.

The average prices of gas-works products during the week were: Gas-works tar, 21s. to 20s. Pitch—East Coast, 40s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 46s. f.o.b.* Toluole, naked, North, 1s. 7¼d. to 1s. 8¼d. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 3d. to 1s. 3½d. Heavy naphtha, North, 1s. to 1s. 0½d. Creosote, in bulk, North, liquid and salty, 3½d. to 3¾d.; low-gravity, 1¼d. to 1½d.; Scotland, 3½d. to 3¾d. Heavy oils, in bulk, North, 5½d. to 6d. Carbolic acid, 60's, 2s. 4d. to 2s. 5d. prompt. Naphthalene, £12 to £14. Salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

* It is proposed in future to quote all prices for pitch on the basis of f.o.b. In order to arrive at the f.a.s. value at any port, it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

Glasgow, *April* 5.

Tar distillers' quotations remain steady for most products. There are very few orders passing at the moment however, and possibly prices could be reduced a fraction for reasonable quantities.

Pitch.—The nominal value is 47s. 6d. to 50s. per ton f.a.s. Glasgow for export. Home orders are being accepted at about 50s. per ton *ex* works.

Tar is steady at 4d. to 4¼d. per gallon filled into buyers' packages at makers' works.

Creosote.—The market continues very quiet, and prices for moderate quantities are approximately 3½d. to 4d. per gallon for B.E.S.A. specification oil and 3d. to 3½d. per gallon for both low gravity and neutral oils—all f.o.r. works.

Cresylic is unaltered, spot lots being scarce. Pale 97/99 p.ct. is 1s. 8¾d. to 1s. 9¾d. per gallon; dark 97/99 p.ct., 1s. 7¼d. to 1s. 8¼d. per gallon; pale 99/100 p.ct., 1s. 11¼d. to 2s. 0¼d. per gallon—all *ex* works.

Crude naphtha is easier at about 4¾d. to 5¼d. per gallon f.o.r.

Solvent naphtha.—There is very little business passing; 90/100 is 1s. 2¾d. to 1s. 3½d. per gallon, and 90/190 is 1s. to 1s. 1d. per gallon.

Motor benzole is unchanged at about 1s. 6d. to 1s. 6½d. per gallon *ex* works in bulk.

Pyridines are dull. 90/140 is 4s. 3d. to 4s. 6d. per gallon; 90/160, 3s. 3d. to 3s. 6d. per gallon; 90/180, 2s. 6d. to 2s. 9d. per gallon; and 90/220, about 1s. 6d. to 2s. per gallon.

Benzole Prices.

The following are considered to be the market prices at the present time:

	s. d.	s. d.	
Crude benzole	0 10.	to 0 11	per gallon at works
Motor ,,	1 5½	,, 1 6½	,, ,, ,,
Pure ,,	1 10	,, 1 11	,, ,, ,,

Contracts Open.

Coal.

The Teignmouth Urban District Council Gas Department invite tenders for the supply of coal. [See advert. on p. 106.]

Foundations.

The Gas Committee of the City of Stoke-on-Trent invite tenders for the work and materials required for foundations. [See advert. on p. 106.]

Gasholder.

The Gas Committee of the City of Stoke-on-Trent invite tenders for the erection of a waterless gasholder. [See advert. on p. 106.]

Overseas Opportunities.

[From the Board of Trade Journal.]

New Zealand.

Lubricating and Gas-Making Oil.—The Officer-in-Charge of the Office of H.M. Trade Commissioner at Wellington reports that the New Zealand Government Railway Department is calling for tenders, to be presented in Wellington by July 30, 1930, for the supply of lubricating and gas-making oils. Firms desirous of offering oils of British manufacture can obtain further particulars of this call for tenders upon application to the Department of Overseas Trade, 35, Old Queen Street, S.W. 1. (Ref. B.X. 6268.)

Notes on New Books.

RESULTS IN VERTICAL RETORTS.*

Reviewed by Alwyne Meade.

The past quarter of a century has witnessed almost staggering developments in the technique of town gas production, but particularly during the past ten years has the rate of evolution been so great as to have rendered it almost impossible for any single individual to keep abreast of the progress registered in almost every one of the correlated processes associated with the manufacture of gas. As an industry we were, perhaps, slow to respond to the progress of science, sceptical at first of departing from an inherent conservatism, a little intolerant of being dictated to by the research mind, and to an extent indignant that our time-honoured practical convictions should be found capable of criticism. The exigencies of war, however, wrought revolutionary changes, the country as a whole was swept by a scientific renascence, and the gas industry, falling into the new order of things, was carried along by the tide. The result to-day is that the old composite gas engineer has more or less disappeared; we are rapidly developing into a collection of experts, and our industry has, in fact, become so specialized that none can lay claim to omniscience.

For this reason we have, perhaps unconsciously, introduced a process of exchange, pooling to an extent our knowledge, and borrowing of experience in those particular channels where we know such experience to be greater than our own. As an example it is only necessary to start at the fountain head and consider the process of carbonization. Time was when the gas engineer had no alternative but the horizontal retort, whereas to-day he is faced with the fact that the gas undertakings in this country are actually employing not only some six different principles of carbonization, but different varieties of each of these principles. Possibly the faithful adherent to horizontals is attracted by the advantages offered by some alternative system, the construction and operation of which are comparatively novel to him. If information of a definite and comprehensive nature is not available, there is, perhaps, a lurking tendency to play for safety, to stand by the system which has at least proved its capabilities, and thereby to lose the benefit which might have been derived from a change of policy. Nowadays, however, the literature available on all descriptions of gas-works plant has become so diverse and informative as to form what might almost be regarded as a series of specialized text-books. The volume under review falls immediately into this category, and it might well be called the text-book of the Glover-West retort.

It is a surprising fact, particularly to those who may still hold the belief that under certain conditions intermittent carbonization in horizontal retorts cannot be surpassed, that between 50 and 60 p.ct. of the gas produced in this country is derived from continuous vertical systems. This is a proud record for a couple of decades, and must surely indicate that the popular verdict is the best testimonial to the efficacy of the vertical system and its ability to live up to its promises. If this were not the case, we should not be faced with the outstanding fact that continuous verticals are now producing more gas than the combined amount derived from all other systems of carbonization. In spite of this, it is most unlikely that the industry will ever become "100 p.ct. vertical," for the stimulus of competition has effected outstanding improvements in horizontal bench construction, and one is always faced with the fact that one of the great metropolitan undertakings produces over 16,000 million c.ft. per annum entirely from horizontal retorts, and with an efficiency which is not greatly below that of vertical plant.

There is no question, however, that the continuous vertical retort is an instrument in the hands of the gas engineer by which he can take full advantage of the greater freedom conferred upon the industry by the Gas Regulation Act to make and distribute gas of whatever quality happens to be most remunerative in any particular locality and under any particular conditions prevailing in the coke market.

The information collected together in this volume is of so detailed and comprehensive a nature that it should go far towards covering almost any given set of conditions appertaining to a particular locality, and at the same time enable a close estimate to be formed of the technical and financial results which could be looked for as a result of the introduction of vertical retorts. Innumerable detailed analyses of various characteristic coals and their yields after carbonization are included, and there is a valuable section dealing essentially with carbonization and scientific control. This last-named section should prove of considerable utility to the chemical officers of any gas undertaking, whatever the system of carbonization in operation. The volume as a whole, indeed, represents an enterprising attempt to tell a complete story of the capabilities of a modern and popular form of gas-works practice; and certainly those who have been responsible for it have not failed in their endeavour to provide gas engineers of all opinions with a highly valuable and unusual addition to their libraries.

* Issued by West's Gas Improvement Co.

Topical Items.

Institution of Chemical Engineers.

The dinner which followed last Friday's annual meeting of the Institution of Chemical Engineers was held at the Hotel Victoria, Northumberland Avenue, London, and was largely attended, those present including a number of distinguished guests. The Chair was occupied by the President, Mr. J. Arthur Reavell, M.Inst.Mech.E., who earlier in the day had delivered an address on "The Rôle of Science in Industry;" and the toast list was interspersed with an enjoyable programme by the Brompton Quartette. The Institution of Gas Engineers was represented by Mr. J. R. W. Alexander.

The toast of "The Institution of Chemical Engineers" was in the capable hands of Viscount Leverhulme of the Western Isles, who congratulated the Institution upon the great progress it had made. The Institution, he said, was a concrete recognition of the fact that there had come into existence in recent years an indispensable expert who was both an engineer and a chemist. Under modern scientific manufacturing conditions, chemistry and engineering could be no longer placed in separate compartments. It could not be denied that the combination had proved a great benefit to mankind. There must be no slackening of research.

"Science and Industry" was proposed by Sir Josiah Stamp, G.B.E., who remarked that the Institution had established out of two old sciences a new science of their own. The stage had now been reached when the industrialist and the scientist realized that they had to "live under the same roof." The scientist should be right inside the industrial machine, watching the progress of what was done. With the help of this Institution, they would get the best possible results.

The response was in the hands of Dr. F. E. Smith, C.B., C.B.E., F.R.S. (Secretary of the Department of Scientific and Industrial Research), and Dr. Herbert Levinstein. Dr. Smith declared that from industrial research industry must gain and the community also. If illumination, for example, of the intensity provided to-day had to be furnished by the old methods in vogue before the introduction of the incandescent gas burner and the gasfilled electric lamp the cost would be millions more, without any increased benefit to the community.

The health of the President was enthusiastically honoured, at the call of Sir Alexander Gibb, G.B.E., C.B.

During the course of the proceedings, the President expressed regret at the absence of Sir Arthur Duckham, G.B.E., K.C.B., Past President, who, he said, had rendered wonderful service during the formation and early days of the Institution.

Co-Partnership at Chester.

During 1929, the Directors of the Chester United Gas Company allocated £1418 to the co-partnership fund, enabling a bonus to be declared at 6½ p.ct. The number who participate in the scheme is 146, and during the year co-partners purchased £840 of the Company's ordinary stock.

Addressing those present at the annual meeting, Sir John M. Frost, J.P., Chairman of the Board of Directors, said: "Under our co-partnership scheme you all have an added interest in the Company's progress and welfare, and, what is very important, the co-partnership principle as applied to our industry makes identical the interests of proprietors, consumers, and employees. Because of that we have every reason to be pleased with our achievements, and to hope that our co-partnership scheme will continue to flourish, and so reflect the prosperity of our undertaking and the interests of the community in which we live and which you all serve."

Fire at Newcastle Gas Company's Bye-Product Works.

On Friday morning last a fierce outbreak of fire occurred at the Newcastle-upon-Tyne and Gateshead Gas Company's Bye-Product Works at St. Anthony's. The following official statement was issued by the Company's Chief Engineer (Mr. F. P. Tarratt) and the Manager of the St. Anthony's Works (Mr. S. A. Wikner):

The fire appears to have originated in the base of one of the oil stills. But for the high south-easterly wind, which carried the blaze over the plant, it would easily have been possible to confine the fire to the still in which the trouble began.

It is impossible, at this stage, to estimate accurately the money loss involved; but the plant will have to be reconstructed. Fortunately, our principal work of tar distillation will not be affected, and no men will be thrown out of work by the destruction of the naphthalene plant.

River Pollution Central Council Formed.

A new body to be known as the Central Council for Rivers Protection was formed at a meeting at Fishmongers' Hall. It comprises representatives of the Fishmongers' Company, the British Waterworks Association, the Royal Sanitary Institute, the Society of Medical Officers of Health, the Pure Rivers Society, the Council for the Preservation of Rural England, the Alliance for the Prevention of the Pollution of Rivers and Streams, the Salmon and Trout Association, the National Association of Fishery Boards, the National Federation of Anglers, and other bodies interested in various aspects of the rivers of England and Wales.

The chief object of the Central Council will be to co-ordinate the work which its constituent bodies have been doing separately, so as to bring about an improvement in the condition of the polluted rivers of England and Wales, and to renew pressure upon the Government to take early action. Further propaganda work will be undertaken among the general public.

The Hon. Secretaries of the new Council are Mr. C. N. Hooper, Clerk of the Fishmongers' Company, and Mr. G. P. Warner Terry, Secretary of the British Waterworks Association. Any communications should be addressed to the Hon. Secretaries at Fishmongers' Hall, London Bridge, E.C. 4.

Early Days of Gas Storage.

At a meeting of the Belfast Association of Engineers, Mr. A. McI. Cleland, of Belfast, a former President of the Association, read a paper entitled "The Evolution of the Gasholder." In it he had some interesting things to say about the early days of gas storage.

He remarked that in 1819, the author of a "Philosophical and Practical Treatise on Gas Light" writes that a gasholder "is a cylinder, the diameter being from 33 to 40 ft. and the height 18 to 23 ft." These sizes, giving capacities from 15,000 to 28,000 c.ft., he recommends as most suitable for "large" works.

Towards the end of the 18th century, when chemists and physicists first began to study the nature and composition of gases, the only way of storing the small quantities of such fluids then available was by using ox bladders. Such a "gasholder," covered by a cylindrical vessel and forced upwards by a spiral spring, enabled the chemist or physicist to draw off small quantities of gas at will.

About the year ~~1870~~ 1790, Dr. Joseph Priestly invented the pneumatic trough, with its jars and sliding trays, now so familiar to all chemical students. And two years later Lavoisier (Priestly's friend and collaborator in Paris) produced his "hydrostatic bellows," as he called it, which was neither more nor less than a metal "jar" suspended by pulleys in a metal "trough" containing water, and provided with a pipe for the ingress and egress of the gas, or, in other words, what would now be considered a tank and gasholder reduced to lecture size. Of this "gazometer," as Lavoisier names it, he was evidently justly proud, though he admits it was expensive; and in his "Elements of Chemistry" translated by Robert Kerr in 1793, he devotes an entire section of eleven pages and the whole of plate No. 8 to a detailed description of the apparatus. And it is really to the inventive powers of Priestly and Lavoisier that we owe the genesis of the gasholder.

The first tanks used in gas manufacture were brewers' vats or rectangular cast-iron vessels, but these were soon abandoned in favour of the circular brick or stone tank in which floated an inverted bell of sheet iron. Three or more iron posts or tripods were securely fixed to the edge of the tank, each carrying a pulley wheel over which passed a chain or rope to which was suspended counterbalance weights. As the weights were increased or decreased the pressure on the district became less or greater, as at this time any apparatus like the district governor had not been invented.

As business increased and the demands for town gas grew, larger holders were provided simply by increasing the diameter and depth of the tank and adding a few more posts or cast-iron columns. Thus the stereotyped design for a gasholder became a repetition of single lift holders with trussed roofs, each in its separate tank, guided in its ascent or descent by rollers working against the inner faces of rigidly fixed cast iron columns, braced at their tops, and carrying counterbalancing weights and chains. And so matters remained till about the year 1832, when a vast improvement was made by the invention of the hydraulic cup, and holders became telescoped.

An Example of Efficiency in the Operations of a Small Undertaking.

[Contributed.]

The writer recently visited the works of the Faringdon Gas Light and Coke Company. Faringdon has an annual make of gas of only 12 million c.ft.; a population of 2758. The Company's paid-up capital amounts to £3290. The sale of gas last year yielded a sum of £4333. In repairs and maintenance of works £374 was spent; the whole transactions of the twelve months resulting in a profit of £844, on which a dividend of 6½ p.ct. has been declared. The bank balance amounted to £1735.

Two years ago the Company installed an automatic mechanically-operated Tully total gasification plant; since that time sufficient balance has been accumulated to enable the purchase of a new gasholder to be effected, the additional storage being demanded by the increasing sales of gas for lighting, heating, cooking, and power. When it is stated that the Company have to face severe electrical competition, the success of the management of their affairs will be more apparent. Certainly a word of praise is due to the Secretary and General Manager, Mr. E. Caddy.

Burnley Adopt a Voluntary Four-Part System of Charging for Gas.

Last week the Burnley Town Council confirmed a recommendation of the Gas Committee to adopt a new four-part system of charging for gas for trade and industrial purposes. The objects of the suggested introduction were defined as follows:

1. The present system is inequitable between the consumers.
2. One of the best ways of reducing the costs is to cultivate a better load factor. The mains are laid, or will shortly be laid, large enough to deal with the maximum demand for gas at any one time. This occurs at certain periods during the winter. If, therefore, the Department can increase its output at other times of the day and year, such increased output will not be accompanied by increased distribution costs.
3. By offering to industry a tariff worked out on the principles laid forth, the Department will be able to offer gas at a price which will make it more competitive with other fuels, and thus again develop the output of gas.
4. By placing such a low tariff at the disposal of industry, the Gas Department will be contributing its quota to the efforts being made by the Municipality of Burnley to attract new industries.

The scheme will not be compulsory, and can be adopted by any trade or industrial consumer who considers such a scale would be advantageous, having in view either his present consumption, or the possibilities of the increased use of gas.

The terms are so drawn up as to enable the consumer to cheapen the price of gas purchased by increased consumption; in other words, the more gas used, the cheaper the price.

The terms of the tariff are as follows:

Four-part charge—	£	s.	d.	
Customer charge	1	1	4	per annum.
Manufacturing demand charge	0	5	4	per annum (per 100 c.ft. per day, maximum).
Distribution demand charge	2	16	0	per annum (per 100 c.ft. per hour, maximum).
Commodity charge	0	0	3½	per therm on all gas consumed.

A discount of 5 p.ct. will be allowed on all the above items with the exception of the commodity charge, for payment of the whole of the account within the specified period. Accounts will be rendered monthly with fourteen days' grace for discount.

As the Corporation Gas Department have laid a main seven miles long for the purchase of crude coke oven gas, supplies of this are offered for industrial purposes to customers along the route of the main, with the substitution of a price of 2½d. per therm against the 3½d. above mentioned.

River Pollution and Fisheries.

The Ministry of Agriculture and Fisheries Standing Committee on River Pollution have published a non-technical report of the work during 1926, 1927, and 1928 (H.M. Stationery Office, Adastral House, Kingsway, W.C. 2; price 1s. 3d. net). There is an outline of the experiments during the winter of 1925-26 carried out on the toxicity of aqueous extracts of tar to the ova and spermatozoa of the trout, and of phenol to developing trout fry.

One section of the report relates to trials commenced in 1924 on the effect of sealing a tarred macadam surface with a coating of bitumen, for which purpose an experimental road at Alresford was re-made as required, and the rain-washings from its surface were tested over a period of eighteen months from Sept. 20, 1924.

It had been expected, states the report, that the surface coating of bitumen would prevent all solution of tar constituents by the rain water, but analysis showed that this was not the case; considerable amounts of tar acids (6 to 8 parts per 100,000) appeared in the drainage from the road during the first few days after spraying. The amount decreased gradually till, on Jan. 25, 1925, it was only 0·2 part per 100,000. No tar acids could be detected on March 6, nor on any of the nine subsequent tests, the last of which was on May 6, 1926.

The reason for the presence of tar acids in the drainage from the bitumen-sealed road is supposed to be due to the fact that there was some mixture of the two under the influence of the high temperature at which ordinary bitumen has to be applied. On the next occasion when the road needs re-making (as opposed to re-surfacing), it is hoped to try the experiment of sealing a tarred macadam road with one of the bitumen emulsions which can be applied cold.

Improvements to Coleraine Works.

Ulster Home Office Inquiry.

At the Ulster Home Office Inquiry into the application by Coleraine Urban Council for sanction to raise a £15,000 loan for improvements to the gas-works—these to include the provision of a new gasholder and the installation of new vertical retorts to replace the existing horizontal retorts—Dr. H. A. Anderson, the Council's Solicitor, mentioned that the gas-works was established in 1845, and that the undertaking was one of the oldest in the United Kingdom.

Mr. Wm. Henry, Town Clerk, said there was no debt whatever on the gas-works. There was a cash balance reserve to credit of £4131. If the loan applied for was granted at 5½ p.ct. repayable in twenty years, it would entail in the first year a payment of £1519 in respect of principal and interest. Mr. J. D. Smith, General Manager of the Belfast Gas Department, whom the Borough Council had consulted, estimated in his report that there would be an economy as a result of the improvements suggested by him which would cover the whole of the repayment of the loan, including interest. It would not be necessary to call upon the rates at all, and the Council were satisfied that it would not entail any increase in the price of gas. Gas was at present being supplied at the very moderate price of 3s. 4d. per 1000 c.ft., which, with the exception of Belfast and Bangor, was the lowest in Ireland. Belfast, he thought, was about the lowest in the United Kingdom.

Mr. J. D. Smith submitted his report, which had been adopted by the Borough Council. He was of opinion that the proposed improvements would afford facilities for giving an increased supply, and an ample and always satisfactory service to consumers, and would result in a saving of £1538 per annum as compared with present costs.

Mr. F. G. M'Elwee, Manager of the works, also gave evidence.

Society of Incorporated Accountants' and Auditors' Year Book, 1930.—This volume (being the 43rd of the series) is now published. It is in a somewhat different form from that published in former years, and comprises alphabetical and topographical lists of members and firms (of which at least one partner is an incorporated accountant). The book contains the names of 5225 members, of whom 4288 are in England and Wales, 108 in Scotland, 132 in Ireland, and 697 in the British Dominions, Colonies, and Foreign Countries. The Society has district organizations in twenty of the leading towns of Great Britain and Northern Ireland, and there are also Branches of Incorporated Accountants in Scotland, Ireland, Canada, Australia, and South Africa. A special section of the book is devoted to the Examinations and Publications of the Society, to the facilities offered at Incorporated Accountants' Hall, and to the Incorporated Accountants' Benevolent Fund. The current volume extends to 1063 pages, and contains, in addition to the foregoing, the full regulations of the Society.

Western Enamelled Ironworks has been registered, with a nominal capital of £100, as manufacturers of enamelled steel tables, hospital furniture, kitchen cabinets, refrigerators, and electric and gas cookers.

Fuel Research at Sheffield University.—A summary of the research work carried out in the Departments of Mining and Fuel Technology, Sheffield University, has been published for general distribution among those interested in the work of the University.

Lecture on Gas in Glasgow.—Mr. W. Brownhill Smith, Sub-Convener of the Glasgow Corporation Gas Committee, dealt with methods for reducing the price of gas and increasing the demand for it, in a lecture delivered to the members of the Royal Philosophical Society of Glasgow last week.

Gas Exhibition at Gourock.—The Gourock Corporation Gas Department commenced a Gas Exhibition in the Gamble Institute on Tuesday of last week, when gas appliances of every description were exhibited. The exhibition was opened by Judge Mrs. Young, and cooking demonstrations were given twice daily by Miss E. M. Dods, M.C.A., Edinburgh.

National Smoke Abatement Society.—A public conference on By-Laws under section 5 of the Public Health (Smoke Abatement) Act, 1926, will be held on Friday, May 2, at 71, Eccleston Square, Westminster, S.W. 1, commencing at 3.30 p.m. The discussion will be opened by a paper to be read by Mr. C. J. Allpass, Chairman of the Greater London Regional Smoke Abatement Committee, and Chairman of the Public Control Committee of the London County Council.

Colonial Gas Association.—We are informed by Mr. C. Holmes Hunt, Secretary of the Association, that a cable has been received from Melbourne stating that at a recent meeting of the Directors, interim dividends were declared at the rate of 8 p.ct. per annum (*less* income-tax) on the preference shares, and at the rate of 9 p.ct. per annum (*less* income-tax) on the ordinary shares, for the half-year ended Dec. 31 last. The dividends will be payable April 12 next. The transfer books of the Company will be closed as from 5 p.m. Tuesday, April 1, to 9 a.m., Saturday, April 12.

Gas Display at Birmingham Exhibition.—At the National Trades Exhibition, which was opened on March 24, by the Lord Mayor of Birmingham, at Bingley Hall, Birmingham, the City of Birmingham Gas Department have a stand of exceptional interest. "Up-to-date" is the motif which is stressed. The central feature is a futurist boudoir in the French style, which is a striking example of the artistic effect of colour with suitably designed lighting and heating. Attention is directed towards a new "High Level" cooker in willow pattern porcelain, an economical water heater for the villa residence or bungalow, and a refrigerator.

Gasmen in Gilbert and Sullivan Opera.—One of the largest Amateur Operatic Societies in London will, this week, give performances of "The Yeomen of the Guard," at the East Greenwich Institute. The Society, which is composed of employees of the South Metropolitan Gas Company, has nearly two hundred members, and, as a rule, produces at least two light operas each year. Miss N. Webber, a young girl clerk, will direct this season's production, and Mr. Sydney Herbert, who is a Roads Inspector, will be responsible for an orchestra of about thirty gasmen. The performances will be given on Wednesday, April 9, and three consecutive days.

Experimental Street Lighting at Lewisham.—Considerable interest continues to be taken in the experimental street lighting installation on the Hastings Road at Lewisham, erected by the South Metropolitan Gas Company and the South Metropolitan Electric Light and Power Company, illustrated in our issue of last week. On Wednesday night it was visited by Mr. R. J. Rogers, of the Birmingham Corporation Gas Department, with Mr. Marsh, of the same Department, Mr. Robert Mason, Public Lighting Superintendent, City of Birmingham, and Mr. Arthur Tennant, Sales Manager, East Surrey Gas Company. It is hoped that members of the industry will avail themselves of the opportunity of inspecting this fine example of centrally suspended road lighting by gas while it exists.

"Tons of Money" at Portsmouth.—Long-service awards were made to a number of employees retiring from the service of the Portsmouth Gas Company on reaching the age limit of 65 years at a gathering held at the Oddfellows' Hall, Kingston Road, Portsmouth, on March 31. During an interval in the performance of "Tons of Money," presented by a company of local artistes, Mr. T. H. F. Lapthorn, J.P., Chairman of the Company, distributed gifts of £5 each to the retiring employees, the recipients being Messrs. W. Dyehouse (who had completed 42 years' service), T. W. Ashley (38 years), J. T. Mills (37 years), S. J. Kingsford (35 years), W. E. Batt and J. J. Talbut (each 26 years), C. Ellison (24 years), J. Hooper (23 years), J. C. Rumbold (22 years), E. T. Tallyn (17 years), W. C. Smallbone (13 years), A. J. Austin (12 years), and J. B. Inkpen (11 years). A hearty vote of thanks to Mr. Lapthorn was carried on the call of Mr. T. Carmichael, the Engineer and Manager.

Southampton Gas Company Veterans Honoured.

[*Photograph by courtesy of the "Southern Daily Echo."*

Our picture is of the twelve employees, with Mr. J. R. H. Jacobs (Managing Director) and Mr. E. Dunbar (Assistant Engineer). Back row (left to right): H. Sanders (49 years), A. Smith (39 years), J. Penny (30 years), S. Gradidge (55 years), and W. Brown (39 years). Centre (left to right): E. Blake (47 years), G. Dear (45 years), H. Cole (42 years), E. Reeves (52 years), and F. Williams (45 years). Front (left to right): A. Moon (52 years), Mr. Jacobs, Mr. Dunbar, and J. Stanbrook (54 years).

Presentations in recognition of long and faithful service with the Southampton Gas Light and Coke Company were made in the Board Room at the Company's Offices on April 4, to twelve employees, whose service aggregates 549 years. Four of the men have been with the Company for over 50 years, and five others have each over 40 years' service to their credit.

In the presence of the Board of Directors, the Chairman (Sir Russell Bencraft, J.P.) informed these employees that the Board had granted them pensions, and presented each with the gift he had chosen, a gold watch, a handsome striking clock, or an armchair. The gifts bore suitable inscriptions.

Before making the presentations, Sir Russell Bencraft said that on behalf of the Board he wished to say how appreciative they were of the splendid service the men had rendered to the Company. The majority of them had spent the whole of their working lifetime in the service of the Company.

"We are a very happy Company," said Sir Russell. "We work well with our employees, and we do our best for them when they are sick." The time had come for those who were present that day to retire, and the Board felt they would like to do something for them in their old age. They had a scheme in prospect under which eventually employees would be able to claim that as a right. At present there was no such scheme, but the Board had decided, in view of the men's long and faithful service, to give them pensions on various scales according to the position they held and their length of service. They had been splendid and loyal servants, and he expressed the hope that they would live many years to enjoy their pensions.

Col. Sir Edwin Perkins, C.B.E., Deputy-Chairman of the Board, endorsed the remarks of the Chairman.

The presentations were then made by the Chairman, and afterwards the recipients shook hands with each member of the Board.

Members of the Board present, in addition to the Chairman and Deputy-Chairman, were: Mr. A. W. Oke, Mr. R. C. S. Pearce, Mr. T. Carmichael, and Mr. J. R. H. Jacobs (Managing Director). Others present were Mr. S. E. Whitehead (Engineer), Mr. E. Dunbar (Assistant Engineer), and Mr. H. Runham (Secretary).

Standard Shatter Test for Coke.

The Midland, Northern, and Scottish Coke Research Committees have adopted and advocate the following standard method for the shatter test:

(1) *Apparatus.*—The shatter test apparatus* shall consist of a box 18 in. in width, 28 in. in length, and approximately 15 in. in depth, supported above a rigidly mounted cast-iron or steel plate, not less than ½ in. in thickness, and not less than 38 in. in width and 48 in. in length. The inside of the bottom of the box when in its highest position shall be 6 ft. above the plate. The bottom of the box shall consist of two doors hinged lengthwise and latched so that they will swing open freely and not impede the fall of the coke. Boards about 8 in. in height shall be placed around the plate so that no coke is lost. To minimize the breakage of coke, which might otherwise occur while placing the sample in the box, the box shall be so suspended that it can be lowered to a convenient level for filling. Convenient forms of shatter test apparatus are shown in the figures.

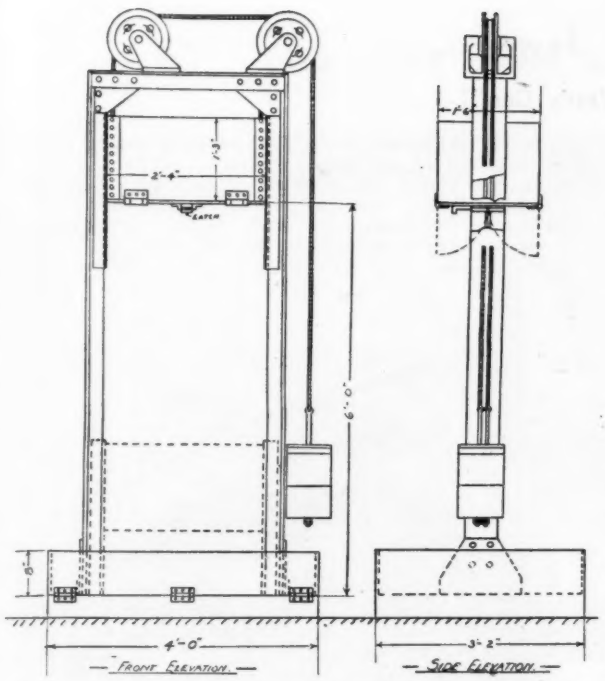
(2) *Screens.*—For determining the breakage of the coke sample, square-mesh screens with the following openings shall be used: 2 in., 1½ in., 1 in., and ½ in. These screens should be machine stamped from mild-steel plates† with a limit of error of 1/32 in.

(3) *Procedure.*—Fifty pounds‡ of coke all over 2 in. shall be placed in the box of the shatter test apparatus, the coke levelled, the box raised, and the coke dropped on to the plate. The box shall be lowered and all the coke shovelled into it indiscriminately, but taking care to avoid breakage. The box shall then be raised and the coke again dropped. When the coke has thus been dropped four times in all, it shall be

* The essential dimensions of the shatter test apparatus are those given by the American Society for Testing Materials in "Standard Method of Shatter Test for Coke," Serial Designation: D141–23 (A.S.T.M. Standards, 1927, Part II. Non-Metallic Materials, p. 571).

† Obtainable from Messrs. G. A. Harvey & Co. (London), Ltd., Woolwich Road, London, S.E. 7.

‡ If for any reason the shatter test cannot be made with a true average sample of the original coke over 2 in., the grading of the coke taken for the shatter test should preferably be such that the weight-ratio of the 4 in., 3 in., and 2 in. grades is that found in a preliminary size-analysis of the original coke.

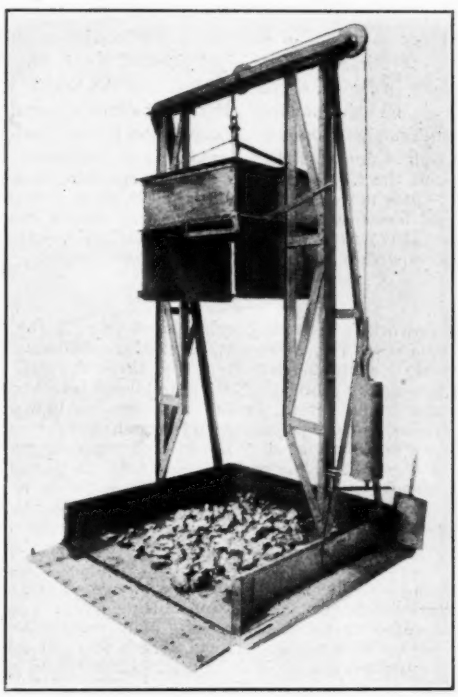


screened by hand in such a way that any piece which can pass through the screen in any position shall be counted as undersize, and the weights of coke of each grade shall be determined to the nearest ounce.

(4) *Statement of Results.*—At least three tests shall be made and the results stated as percentages (given to one decimal place) remaining on 2 in., 1½ in., 1 in., and ½ in. screens. The shatter indices reported shall be the average values of the percentages retained on the 2 in. and 1½ in. screens, and shall be given to the nearest whole number only.

A single figure shall be understood to be the 2 in. index unless otherwise stated. In future, the 1½ in. figure shall invariably be given in addition to the 2 in. figure by stating the shatter indices in the form 74/86, where the figures are the 2 in. and 1½ in. indices respectively.

Where possible, the statement of the shatter indices shall be accompanied by a brief description of the coke; for example, as "blocky coke," "prismatic coke," "narrow oven coke," "compressed-charge coke," "beehive coke."



(5) *Tolerated Deviation.*—If the average deviation of the individual results from their average exceeds 3 and 2 at the 2 in. and 1½ in. screens, respectively, the corresponding shatter indices shall be marked with an asterisk, and if it is desired to base any conclusion or to take any action upon the result a further series of at least two tests shall, if possible, be made and the results thereof averaged with those of the original series.

West's Gas Improvement Company at the B.I.F.

This photograph shows the stand of Messrs. West's Gas Improvement Company at the British Industries Fair at Castle Bromwich. The exhibit was described in the "Journal" for Feb. 19, p. 494. One of the interesting features was a small scale model, accurate in the smallest mechanical detail, which demonstrated the simplicity of feeding and the simultaneous operation of the West lip-bucket conveyor when serving a vertical retort installation.

Rio de Janeiro.

[From "West's Gas."]

The progress of gas in the economy of modern civilization is well evidenced in all the principal cities of South America, and particularly in Brazil, by the operations of the Société Anonyme de Gaz de Rio de Janeiro. The controlling Company is the Brazilian Traction Company, through the Rio de Janeiro Light and Power Company, Ltd., which has enormous interests throughout the city of Rio de Janeiro, operating not only the supply of gas and electricity, but the telephone system, tramways, and buses as well. In a somewhat similar capacity the Company also serves both Santos and San Paulo, both of which are very important centres of Brazilian commerce.

Delivery of Coal.

The gas-works at Rio de Janeiro are situated at the Rua Sao Christovao, some two miles distant from the centre of the city, and are ideally situated for the reception of the raw material for the gas-works process. Coal is unloaded into barges from the steamer at anchor in the bay and conveyed down a small canal running in close proximity to the coal stores of the works. The barges are discharged at the rate of 100 tons per hour by means of a grab, and the coal is deposited into trucks running on an overhead gantry, which is so arranged that it encircles the store completely, while a movable portion operates in the centre so that the trucks can be deflected to any particular point of the store as desired. The movable portion of the gantry is so arranged that coal can be picked up from stock and charged into the trucks by means of a grab and conveyed to the receiving hoppers on the carbonizing plant.

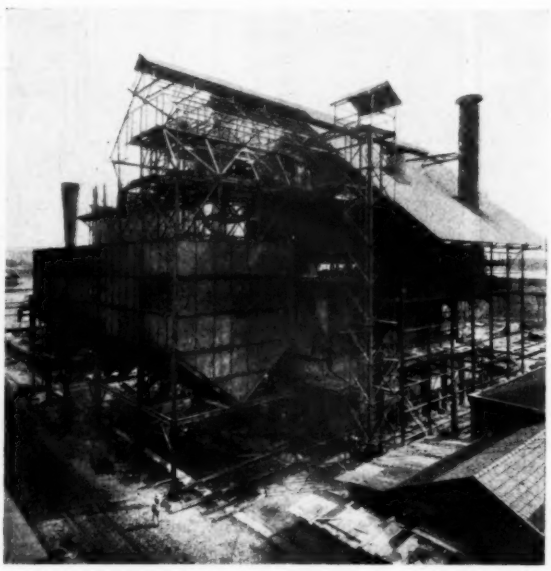
Recent additions to the carbonizing plant include an installation of Glover-West vertical retorts, which was put into operation in September, 1929. The plant, which consists of six settings of the 40-in. by 10-in. retort, 48 retorts in all, arranged in units of fours, has a nominal capacity of about 3½ million c.ft. of 490 B.Th.U. gas per day when using American coals.

Coal Plant.

The foundation work was carried out by the Gas Company, and, owing to the nature of the subsoil, reinforced concrete piles had to be used. The coal plant consists of a breaker, band conveyor, and lip-bucket conveyor, and has a capacity of 80 tons per hour. Coal is received from the store and deposited into a hopper situated below the overhead gantry, from the hopper to a mechanical feeder, and thence through the breaker, which is of the single-roll type. The broken coal passes from the breaker to an Avery weighing machine, which deposits the weighed and broken coal into a hopper over the boot of the band conveyor. The latter in turn delivers the coal to the lip-bucket conveyors encircling the retort bench, which are arranged to deliver coal to the overhead coal-storage bunkers and convey the coke discharged from the retorts to the storage hoppers.

The coke plant consists of a lip-bucket conveyor, with screens, and 1000-ton hoppers. Provision has also been made for the delivery of coke to the C.W.G. plant, and a band conveyor has been provided to receive the coke from the lip-bucket conveyor at the coal bunker level. Coke is charged to another hopper for feeding the producers. A skip electrically propelled runs on an overhead track over the six producer-charging doors, so that the minimum time and labour are expended in this operation.

The installation is also provided with a waste-heat boiler of the Spencer-Bonecourt type, which supplies the retorts with steam, the surplus going to the works. A feature in the design is the absence of the usual retort-house building, deemed unnecessary in this climate, which is extremely hot during the summer months. Other portions of the gas-works are well set out, and include modern auxiliary plant, chemical plant, machine and pattern shops, and well-arranged offices and laboratories.



[From a photograph taken on Aug. 30, 1929.

The Installation of Glover-West Vertical Retorts.

Gas is supplied to the district at high pressure, and is mainly used for household purposes. The following figures show the growth of the Company during the past 20 years:

	Yearly Output of Gas.		
	Cub.M.		C.Ft.
1909	30,438,750	=	1,074,487,875
1919	41,271,600	=	1,456,887,480
1929	85,612,500	=	3,022,121,250

Number of consumers (1929), 43,131.

Miles of main (1929), 542 (873 kilometres).

P. R.

Mains Extensions at Doncaster.—The Doncaster Corporation Gas Committee have received promise of a 50 p.ct. aid from the Unemployment Grants Committee towards the cost of gas mains extensions in the parishes of Sprotborough and Loversall, and the work is to proceed immediately.

Geyser Fatality in Birmingham.—The Birmingham City Coroner (Dr. W. D. Davison) held the adjourned inquest on Wednesday last on John Murrell, who was found dead in the bathroom at the Small Heath Amateur Gardeners' Club, Hobmoor Road, a fortnight ago. Mr. R. J. Rogers (Chief Superintendent of the Birmingham Corporation Gas Fittings Department) explained that in Birmingham geysers were set to consume 180 c.ft. of gas per hour. The one which caused the tragedy was found, on being tested, to be consuming 240 c.ft. per hour. When it was in operation, soot was being deposited in the flues, and carbon monoxide was being generated. The formation of the shaft supposed to be carrying the poisonous gases out through the air-hole was such that the fumes could be carried back by almost any wind into the room. Geysers were perfectly safe if the simple requirements—such as the control of the gas and the efficient fixing of suitable ventilation pipes—were observed. A verdict of "Accidental death" was returned. The jury added a rider that it was advisable that anybody who wished to have a geyser should have to get a permit from the Corporation, who would satisfy themselves that the apparatus had been efficiently fitted.

Chinese Society of Chemical Industry.—We have received from the Society a copy of "Chemical Industry," a quarterly journal published in Chinese and devoted to the interests of industrial chemists and chemical engineers. The journal, which has a wide circulation, is the official organ of the Chinese Society of Chemical Industry, which has been in existence for ten years and has a large membership.

Cardiff Co-Partners' Report.—The Committee of the Cardiff Gas Light and Coke Company's Co-Partnership Scheme present to the co-partners the following statement of accounts to Dec. 31, 1929: The Directors announce a distribution of bonus at the rate of 6½ p.ct. upon the co-partners' wages and salaries for the year 1929. Interest at the rate of 5 p.ct. per annum, amounting in total to £448 12s. 1d. has been credited to co-partners in respect of their outstanding balances, and this sum has been divided among their respective cash accounts. Withdrawals by co-partners amounted to £4003 14s. 5d.—an increase of £118 13s. 1d.—while savings deposited were £1599 16s. 7d., or £99 14s. 5d. less than the previous year. Additional stock was acquired by the co-partners during the year amounting to £3611 at a cost of £3512 9s. 2d. This sum was provided in part—viz., by £756 4s. 10d.—by transfer from cash accounts to trust accounts upon request of co-partners who desired to augment their Trust Accounts so as to increase their stock holdings in the Company. The Committee desire to record their appreciation of the services of Mr. Evans.

Gas—The Fuel of the Future.

These pictures give two views on the stand of the Gas Department at the Birmingham Trades Exhibition. The motif expressed is to a great extent futuristic, both in conception and in the apparatus displayed. The slogan adopted and which is displayed in different positions on the stand is "Gas!—the fuel of the future as of the present," and in proof of this a fine example of modernist design is staged. Gas lighting is not forgotten, and shades are designed to blend accurately with the furnishing.

The central feature, as will be seen, is a furnished boudoir in the modern French style, which is an example of how striking colours (scarlet, gold, and black) can be judiciously and artistically used, and serves to illustrate the beautiful effect of well designed shades with gas lighting. The gas fire in Egyptian gold forms the centre piece. Interest in the fittings is further evoked by the latest type of gas switches with which the lighting is controlled.

Almost as artistic and quite as well conceived is the model kitchen, which is also shown. The place of honour is taken by a high level cooker in Willow pattern porcelain finish. There is also an Electrolux refrigerator (gas operated), and a Sun Hot supplies hot water to the sink and a lavatory basin on another part of the stand, the whole being finished in blue and white enamel.

PARKINSON STOVE COMPANY, LTD.

One of the most representative displays of gas cooking, heating, and hot water appliances is that of the Parkinson Stove Company, Ltd., of Stechford, Birmingham, and London. To be noted particularly are the high-grade porcelain enamelled gas cookers in various finishes. Attention is focussed on the "New Suburbia," with top and bottom oven flue outlets and the "Ajusto" regulator.

Prominent also are models of the "Suburbia" cooker, the distinctive features of which are: Rounded corners of oven to facilitate cleaning; the sides, back, and door packed and enamel lined; the self-locking oven grids; detachable and interchangeable oven gates; high-efficiency hotplate burners with improved top bars.

The "Stechford" is an efficient and compact cooker which admirably meets the cooking requirements of two or three persons, or of bachelor flats, and is excellent for small families, or where kitchen space is limited. Provision for one-level cooking is exemplified in the "Table" cooker.

The display of Parkinson hygienic gas fires—all of which are fitted with the special "Sunray" radiants, is attracting attention. Note should be taken of the new sheathed metal gas fires. In this new series the fronts are encased in actual metal, in a choice of brass, copper, or pewter with hand-beaten effects, complete with solid fenders and dogs. The fender tops are highly polished or chromium plated. A new type of luminous gas-heated radiator is shown, and many popular types of geyser and water heating appliance are demonstrated, including the "Treasure" in the new chromite finish with chromium-plated fittings.

Domestic Fuel by High-Temperature Carbonization.

By J. J. Brown, of the Liverpool Gas Company.

[From a Paper before the Manchester and District Junior Gas Association, April 5.]

The author first described the experiments carried out by Mr. H. H. Thomas, B.Sc., of the Liverpool Gas Company, on the various effects of blending, an abstract of whose results on this work was published in the "Journal" for Feb. 22, 1928, p. 482. Mr. Brown then went on to say that, having produced a series of cokes that were strong, and presumably more reactive than the coke from the swelling coal, our next concern was the behaviour of these fuels in an open grate. After carrying out a number of tests with a proprietary grade, it was decided to install another type of coke-burning grate in its place. This second grate gave complete satisfaction, and is still in use.

The method finally adopted for testing a fuel in the grate was as follows: The fuel to be tested is broken if necessary, and graded to pass 2-in. mesh and rest on 1-in. mesh. Commencing with the grate cold, 12 lbs. of the fuel is weighed out, and put into the grate without any arranging. The meter reading is taken, and the gas burner lighted. A small mirror is placed under the grate so that the fuel can be seen through the bottom grid. When the fuel is ignited the gas is turned off, the meter reading taken, and the time noted. The first galvanometer readings are taken 15 minutes after this, and the series continued thereafter every 15 minutes.

The fire is allowed to burn, and the coke to settle without poking or clearing ashes, as constant conditions are required in order to carry out comparative tests, and disturbance with a poker is a factor that cannot be controlled. The fire is replenished when the coke is level with the top bar of the grate, and enough coke is weighed out and added to bring the level back to the initial level of the fuel. The fire is replenished immediately after taking a ¼-hour reading. The test extends over a period of 5¾ or 6 hours, and during this time the fire requires replenishing twice.

After the final reading has been taken, the fuel in the grate is gathered to the middle, and allowed to burn out. The ash and unburned fuel are collected the following day, and weighed.

From this test the following information is obtained:

(*a*) The volume of gas required to light the fire. This gives a comparison of the ease of ignition of the fuel.

(*b*) The time required to reach a maximum radiation figure in the first period—*i.e.*, from the first reading up to the first replenishing. This is important, as consumers want a fuel that will give a good glowing fire in the shortest possible time.

(*c*) The maximum radiation figure attained in this period must be high, showing a vigorous fuel.

(*d*) The behaviour of the fuel after replenishing. The fire should recover rapidly, for fires are not always carefully tended in the average household, and a fuel is required that will "pick up" quickly after the fire has burned low.

(*e*) The behaviour of the fire after the second replenishing and the weight of ash and unburned fuel show a clean burning fuel, or a reduced radiation figure due to the coke being coated with a fine ash, or to the fire being blocked with small pieces of unburned fuel.

(*f*) The average radiation figure over the whole period enables comparisons to be drawn of the radiation under all conditions of the fire.

It may be put forward as an objection that in the majority of households fires are not lighted by gas. This is granted, of course; but in order to compare the ignitability of various fuels in a grate it is necessary to use a lighting medium which can be withdrawn or stopped immediately the fuel is burning and to be able to measure the quantity used.

When a fire is laid with wood and paper, the manner in which these are placed and the fuel built upon them will always vary. By having the burner in a fixed position relative to the bottom of the grate, we have approximately a constant point of application of the igniting medium.

It has been found that if a fuel will ignite with 4 c.ft. of gas or less, of a calorific value of 475 B.Th.U. per c.ft., it will light very readily with wood and paper, and reach a maximum in the first period in less time than when it is lighted with gas.

It was thought that, by comparing the water content, ash content, volatile matter, shatter test, and behaviour in an open grate, we would have sufficient data to state whether a fuel was suitable or not.

Results indicated that the blending of swelling and non-swelling coals had effected a tremendous improvement in the combustibility of the coke; and as the results of one series of blends were so satisfactory, further samples of three other non-swelling coals were obtained, and tested in the laboratory. Bulk samples were then obtained, and varied blends were carbonized following a procedure similar to the one previously adopted. The proportions, times of carbonization, and temperature of carbonization were varied to obtain as wide a range of fuels as possible. This involved the making of 36 different cokes, and each of these cokes was tested.

It was decided that the results justified further work being carried out in full-size retorts in a retort house working under normal conditions. A very large quantity of blended coke was prepared, and carefully graded, all coke passing through a 2-in. mesh being rejected. A quantity of this large coke, 2½-in. on 2-in. mesh, sufficient to carry out a full test in the experimental grate, was set aside. The remainder of this large coke was broken to pass through a 2-in. mesh, and rest on 1½-in. mesh. All coke passing through a 1½-in. mesh was rejected. A quantity of the coke through 2-in. on 1½-in., sufficient for a test, was reserved, and the remainder broken down, and screened to pass 1½-in. mesh and rest on 1-in. mesh, the smaller coke passing through 1-in. mesh being rejected. This breaking and grading was continued, giving 2½ in., 2 in., 1½ in., 1 in., ½ in. grades of the same coke. By rejecting in each grade the smaller coke passing through the second mesh, and not using this as the next lower grade, we endeavoured to eliminate the more friable portions that might possibly be of a different structure, and have a different combustible nature, giving results in the smaller grades not strictly comparable with the larger sizes. Radiation tests were carried out on these different grades in the experimental grate.

It was found to be impossible to light the 2½-in. size even after burning 20 c.ft. of gas. The coke glowed brightly while the gas was burning, but on extinguishing the gas the coke cooled very rapidly. When one considers the space in between lumps 2½ in. in size, and the few points that are in contact, the failure can easily be understood. A layer of small coke was placed in the bottom of the grate, and the large coke placed on top of it; and the fire then lighted very easily.

This coke gave a maximum reading on the galvanometer of 48 only, 70 minutes after lighting

The 2-in. grade lighted with 6 c.ft. of gas, and reached a maximum reading of 86·8 in 90 minutes.

The 1½-in. size required 4·5 c.ft. of gas, and reached a maximum radiation figure of 80·6 in 85 minutes.

A maximum radiation of 78·1 was reached in 89 minutes by the 1-in. coke, which required only 4 c.ft. of gas to ignite it.

The ½-in. coke also lighted with 4 c.ft. of gas, but reached a maximum of only 52·3 in 80 minutes.

The 1-in. and ½-in. coke ignited more readily, as the coke was more closely packed, and also offered a greater surface to the gas flames than the same weight of the larger sizes. When the fire is lighted, and the gas extinguished, the small size does not offer so free a passage to the air necessary for combustion. This gives a sluggish fire and low radiated heat.

The 2-in. grade gave the highest maximum radiation in the first period, as it was a very open fire. The pieces of fuel at the top of the fire were so large that it took longer for the top of the fuel bed to become radiant, and the presence of these black patches of coke surface delayed the maximum reading. After burning and being replenished, the coke, becoming smaller as it burned away, became more closely packed, and the initial advantage of an open fuel bed was partly nullified.

The 1½-in. size ignited more readily than the 2-in. size, and gave a pleasant fire in a shorter time, although its maximum was lower. On replenishing, the recovery was very rapid, and over the test period the radiation figure was higher than any of the other sizes.

The ½-in. grade gave very unsatisfactory radiation figures throughout the test.

From the foregoing tests it would seem that, for a fuel to be satisfactory as regards both lighting and radiation, the coke should pass through 2-in. mesh, and that all coke passing through ½-in. mesh should be rejected.

In view of these results, it was decided also that in all comparative tests of cokes from blends the coke should be domestic size.

A number of other blends were prepared; the same swelling coal was used, and blended with a non-swelling coal chosen from the coals tested at the experimental plant. As these blends were prepared under approximately normal working conditions, it was expected that the results would show what conditions it would be advisable to employ for large-scale working, when preparing the fuel for sale to the public.

Blends.

—	Blends.		Carbonizing Conditions.			Coke Analysis.				SHATTER TESTS.								
										Large Coke as Discharged.					Graded Coke through 2 In. on 1 In.			
	P.Ct. 1.	P.Ct. B.	Carbonizing Time. Hours.	Temperature Retort. °C.	Comb. Chamber. °C.	Breeze P.Ct.	H_2O. P.Ct.	Ash. P.Ct.	Volatile Matter. P.Ct.	On 2 In.	2 In. on 1½ In.	1½ In. on 1 In.	1 In. on ½ In.	Through ½ In.	On 1½ In.	1½ In on 1 In.	1 In. on ½ In.	Through ½ In.
1 . .	50	50	10	930	1380	7·0	1·48	7·12	1·12	64·0	18·0	8·0	6·4	5·0	50·0	36·0	12·0	3·8
2 . .	66	34	8	950	1370	12·1	3·64	6·35	2·76	68·0	14·0	6·0	6·3	5·3	48·0	36·0	14·0	4·3
3 . .	50	50	9	1060	..	13·4	2·82	9·62	2·58	64·0	16·0	8·0	7·6	6·8	46·0	35·0	18·0	3·0
4 . .	40	60	9	1050	..	13·1	3·58	7·04	2·72	70·0	13·0	8·0	5 6	6·4	52·0	32·0	15·0	5·0
5 . .	50	50	9·5	1100	..	13·4	2·64	6·88	1·46	62·0	14·0	10·0	6·0	7·5	42·0	46·0	14·0	4·3
6 . .	40	60	9·75	1060	..	13·5	3·40	6·82	2·9	66·0	14·0	7·0	12·0	6·3	46·0	34·0	14·0	5·3
7 . .	60	40	10	1070	1400	9·5	1·48	6·96	1·92	58·0	17·0	11·0	5·9	8·0	48·0	40·0	11·0	3·5
8 . .	60	40	10	1030	..	10·3	2·44	7·04	1·76	66·0	12·0	9·0	7·8	5·5	56·0	34·0	8·0	3·6
9 . .	60	40	10·25	1020	..	7·4	7·0	6·25	2·51	54·0	18·0	12·0	12·0	6·1	48·0	39·0	11·0	3·8

All the cokes from the blends 1-9 were of a uniform structure, and as can be seen from the table the percentage of breeze in the coke as discharged was low. The shatter tests all showed that the cokes were strong even when the mixture contained 60 p.ct. of the non-swelling coal.

The percentage of volatile matter left in the cokes was low, as can be seen, the highest figure being 2·9 p.ct. Thus, as regards gas making, very little was left in the cokes. It must always be borne in mind that the main commodity as far as gas undertakings are concerned is gas, and the ideal to be kept before one is to extract as much as possible from the fuel, and still produce a good fuel.

The cokes from the blends were graded, dried, and tested in the experimental grate. It was found that the cokes without exception were of a high quality as regards combustibility, but the ignitability showed great variations.

Let us take some of the outstanding figures obtained in these tests. Coke No. 1, a 50-50 mixture carbonized for 10 hours at a retort temperature of 930° C. required 20 c.ft. of gas to light it. Once ignited, it gave a splendid fire.

A similar 50-50 mixture carbonized for 9 hours at a higher temperature, 1060° C., required only 6 c.ft. of gas.

No. 5, another 50-50 mixture carbonized at 1100° C. for 9½ hours also required only 6 c.ft. of gas to light the fire. Referring to the table, it will be seen that No. 5 had a volatile matter content of 1·46 p.ct. compared with 2·58 p.ct. volatile matter in No. 3 coke, and 1·12 p.ct. in No. 1.

Coke No. 4, containing 40 p.ct. swelling coal and 60 p.ct. non-swelling coal, carbonized for 9 hours and containing 2·72 p.ct. of volatile matter, only required 4 c.ft. of gas to ignite it; while No. 6, another 40-60 mixture, carbonized at almost the same temperature, 1060° C., for ½ hour longer required 6 c.ft. of gas—50 p.ct. more than No. 4, although its volatile matter was slightly higher, 2·9 p.ct.

Coke No. 7, another 40-60 blend, carbonized for 10 hours at 1070° C., was as difficult to light as No. 1.

All these cokes gave excellent results, comparable with the blends made at the experimental plant; the combustibility had certainly been improved by the admixture of the non-swelling coal. The ignitability and the time of carbonization, it would seem, are closely related. The volatile matter is not too reliable a guide to the ignitability of the fuel, although it is bound to affect it.

The results seem to show that, while the temperature of carbonization needs careful control, the time the charge is exposed to these heat conditions is also extremely important.

Following on these findings, it was expected that light charges exposed to the same temperature of carbonization for the same time as heavy charges would give inferior cokes, and experience has proved this to be true.

The results obtained in the tests in the standard grate from all these cokes were so good—maximum radiation figures of 90 being attained—that it was decided by the Company to install mixing plant, and to place at our disposal the existing dry coke cooling plant at the Garston Works. The mixing plant was designed to fit in with the existing coal elevating plant. The coal wagons are emptied by a tipper, and the coal is discharged into the crusher pit. Leaving the crushers, the coal is carried underground by a gravity-bucket conveyor covered by chequer plates. The conveyor travels up the retort house wall, entering above the bunkers and then running horizontally to the tray conveyors.

A chute was installed at this horizontal section, and this chute delivers the coals to be blended to two bunkers on the ground, non-swelling coal into one bunker and swelling coal into the other. These bunkers are erected immediately over the gravity-bucket conveyor.

When blending is taking place, the coals leave the bunkers through bottom openings into a horizontal trough, in which two worm feeds revolve. The coals are taken by these works to a central opening in the trough, discharging down a short chute to a gravity-bucket feed, and so to the buckets of the conveyor. The worms are independent of each other, and the speed of each worm can be altered; thus the relative speeds of the worms determine the proportions of the coals.

On discharging, the coke passes through a "G.N." discharging machine into one of two dry cooling devices.

Dry Cooling Devices.

The first consists of four vertical steel chambers built into a concrete tank, through which water is circulated. The tops of the chambers are closed by lids of sheet iron reinforced with angle irons. After being cooled, the coke is discharged from the bottom of the chambers. During cooling, the bottoms of the chambers are closed by self-sealing doors similar in principle to retort lids. It is necessary to have these bottom doors self-sealing to prevent air leakage, and consequent combustion in the cooling chamber. The cool coke is collected in skips and carried by a telpher to the cutting and screening plant. The coke is cooled sufficiently to be handled in three hours.

The second method of dry cooling consists of self-tipping iron containers having close-fitting recessed lids or covers. A concrete tank divided into four separate compartments, each compartment taking one container, is sunk to ground-level. An empty container is lowered into one of these compartments, and the coke from the retort discharged into it. The cover is placed in position, and the recess filled with water to keep the lid cool. Water is circulated round the container, and after about 2 hours the coke is cool enough to be discharged. The cover is removed, the container is lifted by the telpher, carried to the coke cutters, and is tipped.

With the installation of this plant for blending and cooling it was possible to make much larger quantities of dry, blended cokes.

Further blending experiments were carried out, and these were greatly facilitated by the new mixing plant. The proportions, times of carbonization, and temperatures of carbonization were varied, and the resultant fuels tested until it was thought that the most suitable conditions had been obtained for preparing a fuel suitable to offer for sale. Each batch of coke was sampled as it was weighed into bags, and no coke was allowed to leave the works until the daily sample had been tested for ignitability.

"Dryco."

The new fuel was marketed under the name of "Dryco," which name had previously been used for ordinary coke dry cooled in the special plant at Garston. It met with immediate approval, and in a few weeks the demand was greater than the supply.

We were emboldened then to carry out comparative tests of the new fuel against a well-known low-temperature fuel, which we will call "K" and also against a good domestic coal:

—	Gas Required to Light.	Max. Radiation. 1st Period.	Max. Radiation. Time in Minutes.	Average Radiation. Test Period.	P.Ct. Ash and Fuel Remaining.
	C.Ft.				
"Dryco" .	4	105·0	75	93·5	10·2
"K" . .	3	82·6	75	81·1	9·9
Coal . .	2	63·6	120	66·1	11·7

The "Dryco" reached its maximum in the first period in the same time as the low-temperature carbonization fuel, but reached a maximum of 105, as against 82·6. The coal in this period, while giving a so-called cheerful fire of leaping luminous flames was black at the top, as all coal fires are, and so gave a very low radiation figure, 63·6.

The "Dryco" and fuel "K," after being replenished, in the second period reached maxima of 114·6 and 113 in 45 minutes and 60 minutes respectively, while the coal in this period did not rise above 86·3.

The average radiation figures for the test period of 93·5 for the "Dryco," 81·1 for "K," and 66·1 for the coal showed that "Dryco" was superior to the other two.

The "Dryco" was entirely smokeless, while the low-temperature fuel gave off a little smoke when it was lighted and when it was replenished.

The amounts left unconsumed showed very little difference between the "Dryco" and the low-temperature carbonization fuel.

The gas required to light the fuels was less in the test of the low-temperature fuel than for the "Dryco," but as the latter only required 4 c.ft. of gas the test showed that it would ignite readily with wood and paper. A fire was set with wood and paper using this domestic "Dryco," and a good fire was obtained in a shorter space of time than when gas was used.

The low-temperature carbonization fuel contained 11·79 p.ct. of volatile matter; and when one compares this with the low volatile matter in the "Dryco," 2 p.ct., the foregoing tests are very encouraging, and it would seem that we had made a great step forward in the production of a good domestic fuel.

Further samples of non-swelling coals were obtained, and many experimental blends were prepared in an endeavour to widen the choice of coals for blending. The preparation of these cokes was greatly facilitated by the data obtained from the previous experiments. Again it was found that, although a coal may be of the non-swelling variety, it does not follow that it will give a fuel suitable for domestic use when it is blended with a swelling coal.

It was while these experiments were being carried out that an attempt was made to cool the coke more quickly, in order to supply the demand for the new fuel. Wet steam was laid on to the dry cooler chamber, and the hot coke quenched carefully with the steam. It was found that after 1 hour the coke was cooled sufficiently to be handled, compared with 3 hours' cooling by water circulation.

Two quantities of the same blended coke from two retorts were cooled, one by wet steam, the other by water circulation, and the cokes were tested in the standard grate to ascertain if the steam had had any deleterious effect on the coke. Both cokes required 4 c.ft. of gas to light when tested, so that apparently the ignitability of the fuel was not affected by the steam.

The steam-quenched coke reached a higher maximum in a shorter space of time in the first period, and over the period of the test the radiation figure was slightly higher than that of the coke cooled by water circulation.

—	Gas Required to Ignite.	Max. Radiation. 1st Period.	Max. Radiation. Time in Minutes.	Average Radiation. Test Period.	Ash, &c., Remaining.
	C.Ft.	Minutes.			P.Ct.
Dry-cooled .	4	97	76·3	55·7	18·0
Steam-cooled	4	83	94·6	60·3	17·4

It will be noticed that the radiation figures for this experimental blend are lower than the figures given for the "Dryco," also that the radiation figures for the dry-cooled coke are lower throughout. Both these cokes were carbonized for 10 hours, and were the same blend, and the lower figures of one may have been due to this being a smaller charge, with a consequent loss in quality.

This test showed no ill effects due to the steam quenching, and this method of cooling seemed to hold out promise of a rapid cooling method. After a short trial, however, we were forced to abandon it, very reluctantly. It was found that wet steam was very effective when carried out under the personal supervision of the chemist in charge of all these blending operations, Mr. Thomas, but when left to the men working on the bench, the results were unreliable, and, of course, the coke was unsatisfactory. Cooling by water circulation had to be re-adopted, so that it is not possible to give comparative figures of a "Dryco" blend steam-quenched and dry-cooled.

After a number of coals and combinations of coals had been tried, and the cokes examined, two were finally decided upon for normal practice. This final choice of coals, blend, and carbonizing conditions has given excellent results, as can be seen from the following test, the blend being carbonized for 10 hours:

"Dryco" Blend.

(50 P.Ct Swelling Coal, 50 P.Ct. Non-Swelling Coal.)

Gas to Light Fire.	Time Max. Radiation 1st Period.	Max. Radiation 1st Period.	Max. Radiation Test Period.	Average Radiation Test Period.	Ash Remaining.
C.Ft.	Minutes.				P.Ct.
3	80	95	120 +	89·4	10·7

The fuel ignites readily with 3 c.ft. of gas, and gives a very satisfactory fire throughout the test. The reading of 120 + (the galvanometer scale only reads up to 120, and the needle went beyond this) was reached after the fire had been replenished twice. After the first replenishing the fire reached a radiation figure of 92 in 15 minutes, and 108 in 30 minutes. These results are without a shadow of doubt excellent for a high-temperature carbonization coke containing only 2 p.ct. volatile matter.

It is not possible at this juncture to give any definite figures as to costs, for the fuel is being prepared in a retort house along with coal treated in the normal way, so that plant charges, carbonizing costs, and labour costs for quenching and handling cannot be dissected at present.

Fuel Research Board Report.

A sample of the fuel was sent to H.M. Fuel Research Station. As their report is very full, it is only possible to give a brief summary.

Their analysis of the "Dryco" was:

Moisture	1·7 p.ct.
Volatile matter	2·0 ,,
Ash	7·8 ,,

The test for ignitability and combustibility was apparently carried out in a manner similar to our test; the fire, however, was allowed to burn to completion with only one charge of 8 lbs. of fuel. The results obtained for ignitability, radiation, and amount of fuel consumed were compared with those from a standard low-temperature fuel burned under similar conditions.

The "Dryco" burned satisfactorily under test conditions, and the fire had a clean appearance with a total absence of flame in the first 40 minutes. It was moderately easy to ignite, was fairly rapid in burning, and, while it was more slow burning than the standard coke, it is nevertheless a satisfactory domestic fuel.

Some of the fuel was submitted to the Smoke Abatement Society, and a very satisfactory report was also received from them. The Department of the Medical Office of Health of the City was supplied with several samples of "Dryco," and the various members of the Department who tried it are all very enthusiastic, optimistically seeing in it the solution to the smoke nuisance from domestic chimneys. The fuel has become very popular in Liverpool with the people fortunate enough to procure supplies, for, working as we are with restricted plant, the quantities available are small. There is a waiting list of consumers, most of whom are impatient, and we cannot keep up with the demand. It has now been decided to manufacture "Dryco" exclusively at our Eccles Street Works, which at present are carbonizing 130 tons of coal per day.

From the results of the tests given it is seen that in "Dryco" we are producing a domestic fuel that ignites readily with wood and paper, and burns cleanly and freely. It is entirely smokeless, and burns with a total absence of decrepitation. The fire is cheerful, giving flames above the top of the fuel bed, and has a greater radiant efficiency than domestic coal.

Here I must sound a warning note. It may seem to be a very simple procedure to produce a satisfactory domestic fuel such as has been described, but there are many difficulties to be surmounted, and the greatest care has to be exercised. I have only given a summary of the work that has been done. It was commenced in 1927, and research is still being carried out, for many problems encountered have still to be solved.

Discussion.

Mr. J. Graham (Lancaster) asked if they had made any experiments with coke that had been in stock.

Mr. Brown replied that, if they made a domestic coke like they did at Liverpool, the possibilities were that they would never have any stock. It was, however, not advisable to stock the coke; if they did, on no account should it be allowed to get wet.

Mr. W. J. Smith (Engineer and Manager, Bolton; President of the Manchester District Institution of Gas Engineers) spoke of the difficulties appertaining to the coke market in Lancashire generally. He had done a considerable amount of research work on coke, and he could say that the paper had been prepared very carefully, and was a credit to the author. As regards the coke burning well, he thought this was the main point, and that one might give way somewhat on the question of ignitability as not being of major importance. He mentioned that the slow combustion stove required a different coke, and had to be catered for.

Mr. W. P. Smith (Bolton) asked if the author did not think the Sulzer process for coke quenching was the quicker? Did the blending remain as at first blended, and what were the charges of the retorts?

Mr. Brown replied that it remained to be seen whether the Sulzer process was the quicker. The blending remained fairly constant. In reply to the third question, a Fiddes-Aldridge machine was used for charging, and the charge was 14 cwt., the retorts being 22 ft. long.

Mr. S. L. Wright (Colne), Mr. C. H. Bamber (Bolton), and Mr. H. C. Applebee (the President) also spoke, and congratulated the author upon his paper.

Mr. J. Bridge (Elland) moved, and Mr. E. Allen (Liverpool) seconded, a vote of thanks to the author, to which Mr. Brown briefly replied.

ANNUAL DINNER.

The members then adjourned for dinner, among the guests being Mr. W. J. Smith, Mr. J. Bridge (Hon. Secretary of the Manchester Institution), Mr. Duxbury, and Mr. Barrow, J.P.

Coke Grading and Coal Blending.

By T. H. Madden, of Cardiff.

Wales and Monmouthshire Junior Gas Association. Meeting in Cardiff, March 15. Mr. W. E. Crowley, President, in the Chair.

A few years ago the Cardiff Gas Company carefully examined the position of coke, and its utilization. Investigation showed that it was the second most valuable asset in the balance-sheet of the accounts, and that its position was being assailed by other fuels—viz., oil, coal, and coke oven residue coke. It was therefore assumed that coke as delivered from the vertical retorts, or pushed from the horizontal retorts, must be considered as a raw material, and its potentialities as a smokeless fuel carefully investigated.

Investigation of the applications indicated that the possibilities of the domestic and industrial uses of gas coke lay in the direction of sizing, and that conditions of combustion, chimney pull, &c., largely governed the successful issues of application. Experiments were commenced, and an alteration was made to the screening of coke as it left the retort house. It was sized into breeze, nuts, so-called broken coke, and large. This venture indicated that sizing was an important factor, but it was not altogether successful, as complaints arose from time to time on the score of unsuitability of the material supplied. What, then, was the factor? A good deal of money has been expended in altering plant, and research has been carried out.

It was found that coke as it left the retort might be sized, but that the bean and nut size contained the greatest proportion of the ash and shale, due to cleavage through handling by conveyors, and it was also found that the planes of cleavage occurred through the section wherein shale or stone particles appeared. It was then realized that, to supply a satisfactory domestic fuel consisting of graded cokes, it was necessary to screen efficiently all breeze and disassociated shales first, and select the medium and large coke for machine cutting and grading into different sizes. Sorting into size is wrong with coke produced from thro' and thro' coal, but may be correct with cokes made from washed coals containing approximately 4 p.ct. of ash.

Having obtained this information, the Company used only large coke for cutting and grading into sizes, and tried this out on a practical scale. This was so successful that it was decided to install a modern plant to meet the enormously increased sales, assisted by an able commercial coke salesman who advised consumers as to its possibilities.

The considerations for the coke quality of the new plant were these: The coke must be large, entirely free from breeze, as dry as possible, and with a minimum of moisture; and the plant must be capable of dealing daily with small or large road traffic, railway trucks, or even shipping orders. It was required that loading into bags should be continuous, in readiness for any traffic, that the beans, nuts, and broken should be screened again before loading to ensure the absence of dust, and that the working cost should be extremely low, and further, that the prepared coke should be housed in weather-proof hoppers.

It was determined that the secret of grading and preparing the fuels lay in complete screening-out of the dust, seeing always that the material does not contain more than 4 p.ct. of moisture. Wet coke does not permit of successful grading or use.

A market has been found for the finest breeze for chemical work, and quite a remunerative price is obtained.

Coke Grading Plant.

The supply of coke for this plant is obtained from the horizontal and vertical retort houses in a receiving hopper of a capacity of approximately 15 tons. From the hopper the coke is fed by a mechanical feeder of the jigging type into a Cort cutting machine, which cuts the coke but does not crush it. Therefore a minimum of breeze is produced. The cutters will deal with approximately 5000 tons of coke before they require renewing, but this figure varies according to the class of coke being dealt with. It is controversial which is the best cutter—one with two shafts or one with four. A machine having two cutters does our work admirably, however, and with a small percentage of breeze. The coke is then fed into an elevator, which discharges over a short fixed bar screen, prior to the coke entering the final screen. The idea of this is to take out a good percentage of the fines. This type of screen fixed in its present position is very effective. The fines passing through the bar screen are led into the breeze hopper. The coke now enters the rotating screen, which is a Pool patent four-stream "Superfex." There are five storage hoppers, each having a capacity of 25 tons. The outlets to the hoppers are provided with a final screen to eliminate any fine dust before loading into railway wagons or bagging chutes.

The following are the proportions of each size of fuel obtained as a result of cutting and grading:

Breeze	5 p.ct.
Beans	20 ,,
Nuts	25 ,,
Broken	50 ,,

It is found that, as the size of the coke increases, so the percentage of moisture decreases. Considerable investigations have been made and precautions taken in regard to the quenching of hot coke, with the result that recent tests have given an average moisture content of 4 to 5 p.ct.

Some of the many uses of coke are as follows:

Large.—Bakers' ovens, foundries, central heating, hotel grills.

Broken.—Open grates, kitchen ranges, steam road transport, central heating.

Nuts.—Steam raising, greenhouse heating, hot water supplies, closed stoves.

Beans.—Smithy forges.

Blending of Coals.

The first consideration of all gas undertakings is "therms per ton," and, as you are aware, English coals are more suitable for gas production than those of Welsh origin. However, when Welsh coals are blended with certain types of English, the results obtained are interesting, inasmuch as one of the two might be inferior to the other in gas or coke production, yet when they are combined, and carbonized together, the results show a distinct improvement on those when the coals are carbonized separately. There are a number of coals which bind strongly on carbonization, and form exceedingly hard cokes. These often appear to have an excess of binding material. One might expect, therefore, that the blending of this type of coal with coals of less strongly caking properties would produce a coke of passable quality, and at the same time produce the maximum yield of therms per ton from each of the coals. From tests which have been carried out at the Grangetown Works, this has been found in some cases to be confirmed. Naturally, to form the best blend of coke, the coal would have to be broken to a fine state and intimately mixed before carbonization.

Coal testing is regularly carried out, day by day, at the Grangetown Works in a small test plant, which comprises one bed of three horizontal stop-end retorts, each capable of carbonizing 1 cwt. charges per diem, under exactly similar conditions to those prevailing in our retort houses. All coals are regularly tested in this plant, while thorough tests are made of the gas, coke, tar, &c. From these tests considerable knowledge is gained of the cokes produced.

Discussion.

The President asked whether the bags used for coke were made of hemp or jute, and what their capacity was. Also, what was the capacity of the plant?

Mr. A. H. Williams (Cardiff) inquired as to how many men were employed on the plant, and what was the horse-power of the engine.

Mr. T. Lane (Cardiff) asked the author what means there were of ascertaining the ash content of the coke, and mentioned that he had come into contact with consumers who complained that the quality of the coke sent out was not always the same.

Mr. H. S. Bartlett (Cardiff) asked Mr. Madden if he could supply any figures of the relative efficiencies of coal and coke. The burning of coke produced a fine dust. Was there any means of keeping this down to a minimum?

Mr. A. D. Howells (Neath) asked if any particulars could be given of a shatter test of coke made from a straight coal and a blended coal.

Mr. T. Smith (Cardiff) said he had received complaints on the district of fumes being given off by the use of coke. Was there any truth in these statements, and, if so, could the author suggest any remedy?

Mr. B. J. Bell (Cardiff) asked Mr. Madden if he had had any experience of low-temperature fuels.

Mr. R. W. Rees (Neath) inquired if any particulars could be furnished as to the working cost of the plant per ton of coke graded.

Mr. G. Day (Newport) mentioned that bakers generally used furnace oven coke because it was non-clinkering. Were there any uses for coke beans other than that stated—*i.e.*, forges?

Mr. T. H. Madden, in reply, stated that the capacity of the plant was approximately 500 tons per 24 hours. The bags were of jute, having a capacity of 1 cwt. each. One man only was employed on the plant, and he was assisted by two men for bagging purposes, but only for short periods each day. The power of the engine was 40 H.P., and the average consumption was 12 c.ft. per horse-power

hour for the total working period. With regard to ash content, he explained that a fair sample of the coke was taken from the retort house, was thoroughly ground up, and eventually passed through a 60 mesh sieve. One gramme was weighed out, and heated in a crucible until no difference in its weight was noticed. The quality of the coke would vary slightly in accordance with the coals carbonized. Referring to the question raised regarding the relative efficiencies of coal and coke, he could only state, without going into a long, intricate explanation, that the calorific value of coal would be at least 1000 B.Th.U. more than that of coke. There should be little dust when a good graded coke was used. Referring to the shatter test, Mr. Madden said that the shatter index of coke was not generally regarded as a useful test for gas coke, but was mostly used for foundry coke and coke employed for metallurgical purposes. The shatter index of a blended coke would depend on the coals blended. With reference to fumes, the author stated that, if coke was burned in a grate suitable for the purpose, any products of combustion would immediately be taken away. He had had no practical experience of low-temperature fuel. Dealing with the question of costs, he was not in a position to give these, but with regard to the cutters, they would work out about 2d. per ton of coke. Replying to Mr. Day, he did not think there would be any trouble with clinkering provided suitable graded coke was used, and in regard to coke beans, he did not think it advisable to use this grade for any other purpose than that mentioned.

Votes of Thanks.

Mr. G. A. Mogford proposed a vote of thanks to Mr. Madden for his paper, and this was seconded by Mr. W. H. Evans, and carried unanimously.

A cordial vote of thanks to the Chairman and Directors of the Cardiff Gas Light and Coke Company for the facilities afforded for the meeting was proposed by the President and seconded by Mr. A. D. Howells.

Vertical Retort Practice on a Small Works.

With Special Reference to Coal Testing under Normal Working Conditions.

By S. B. Jones, of Clevedon.

[Western Junior Gas Association, Bristol, March 22—Mr. J. T. Spencer in the Chair.]

First, I should like to refer to a paper entitled "The Control of Vertical Retorts," given by Mr. J. W. Pye, of Plymouth, to this Association early this session (see "Journal," Nov. 20, 1929, p. 525). Referring to the laboratory tests for the proximate and ultimate analyses of coal, Mr. Pye said that "these tests gave very little information as to the conditions required to obtain the best results for any quality of gas, or of the bye-products that may be available for sale."

In my opinion, the obtaining of this information with any degree of accuracy is only possible under actual working conditions; and in order to compare various coals and to obtain reliable data for making valuations for contracting purposes, it has been our practice for the last few years to make tests under these conditions of any new coals offered to us before fixing contracts, carefully noting (in addition to the usual test figures, make per ton and per retort, &c.) all working conditions of the plant, and the characteristics and behaviour of the coal and the bye-products.

Our tests are generally carried out during the summer months when we have only one bed of four retorts in action; and as we have no other gas making plant, such as water gas, we utilize the whole of our plant for the test—a condition which cannot be obtained on many works.

Method of Making the Test.

Before elevating any of the coal under test, the coal in the hopper is allowed to work low, and is then carefully levelled. The distance from the top of the hopper to the surface of the coal is measured in feet and inches, and a weighed quantity of the test coal—say, 20 tons—elevated. The coal is again levelled and measured, and the amount of coal per inch depth of hopper calculated. This enables us to calculate the exact hopper stock at the finish of the test.

This 20 tons is carbonized in order to clear the plant of the previous coal, and is not included in the actual test, but it enables us to allow the working conditions to suit the particular class of coal and obtain the desired quality.

When this coal has worked down in the hoppers, it is again levelled, and after the measurements have been carefully noted the actual test coal is elevated. The date and time are booked, the meter reading is taken, and the test commenced.

Coke Tests.

During the test run, the coke drawn from each retort is weighed in a tared bogie, and the weights are recorded. Samples of coke from each retort are tested for moisture and volatile matter. The coke used in the producer is sometimes recorded. The amount is calculated from the average net weight contained in the skips.

All the coke fed to the producers is screened, the breeze being removed by means of a bar screen which takes the place of the bottom plate of the chute leading from the producer coke hopper. The sides are extended below the screen to form another small hopper, which collects the breeze; and this is emptied periodically to the yard.

The temperatures of the setting are taken daily with a Cambridge disappearing filament pyrometer. The combustion chamber temperatures are entered on special temperature charts, and also any alterations made to the main dampers, control dampers, individual nostrils, or air slides. These charts are filed for reference along with the report on the coal.

With regard to the setting temperatures, these are kept as constant as possible during all the tests. In other words, we do not alter the heats to suit different classes of coal.

Each truck of coal elevated is carefully weighed on our own weighbridge, and samples are taken. These samples of coal are taken from marked buckets on the elevator, in order to ensure a continuous sample.

Gas Analyses.

Two complete analyses are made of the gas per day, and tests for calorific value are carried out hourly on the Boys calorimeter and compared with the calorific value calculated from the analyses as a check. In addition, a continuous record of the calorific value is recorded on a "Sigma" instrument, which is periodically checked against the Boys standard calorimeter.

Tar and Liquor.

The tests for the make of tar and liquor per ton of coal carbonized are not so reliable as we should like. This is owing to the difficulty of separating completely the tar from the liquor, owing to emulsion. We collect the tar and liquor made during a stated period, usually eight hours, by pumping all the syphons and keeping them well below their overflows. The tar and liquor collected are put into a large rectangular tank, the capacity of which has been carefully calculated.

During the tests, which often last six or seven days, the following particulars of the working conditions are noted, along with any alterations made: Main steam pressure to the retorts (after the reducing valve), extractor notches, steam notches, speed of engine driving extractor gearing (this should be the same for every test).

Reports are also made on the working of the coal in the retort, and on the coke produced. From the figures obtained, the make per ton, make per retort, throughput, &c., are calculated. The total coke made having been ascertained, all the necessary test figures are only a question of calculation.

I have pointed out that we try to keep constant temperatures in all these tests. We alter the working conditions, and rate of throughput and steaming, so as to obtain a thoroughly burnt off coke.

Some of the local coals (for example, Test A) give very good yields of gas, but the coal is so dense that it requires abnormal heat thoroughly to carbonize it and still maintain throughput. This class of coal is not very good for the winter months if we are to carry out our policy of safe retort temperatures.

Other coals have such free burning qualities (Test B) that it is possible, without raising the heats, to increase the throughput to well over the nominal capacity of the retort.

Another point in support of our policy of keeping constant temperatures is that normally we carbonize coals of widely different characteristics, a truck of Somerset being closely followed by a truck of Derbyshire or Yorkshire. In order to alter our heats to suit these coals, we should have to live on the plant, and be continually altering dampers.

I give later tests made on two coals, and the various remarks made in connection with each other. I might add that the various reports have been borne out by subsequent working.

Of the coal called "A," 100 tons was received for testing, sufficient for a week, but in spite of having put two extra retorts to work we had to finish the test at the end of three days, empty our hopper by throwing the coal into an adjoining hopper, and elevate some better coal in order to increase our makes and maintain our holder stocks.

Incidentally, we did not make a contract for this particular coal.

Test A.—Through Coal.

GLOVER-WEST VERTICALS, CLEVEDON.

Date of test.—12 noon, Monday, Oct. 7, to 12 noon, Thursday, Oct. 10.
Duration of test.—Three days.

Coal—

Coal carbonized	38	tons
Retorts in action per day, average	7	
Throughput per retort per day	1·9	tons
Average number of teeth per retort	4	

Gas—

Total gas made	640,400	c.ft.
Per ton of coal	16,850	,,
Per retort per day	30,500	,,
Therms per ton of coal carbonized	78·8	
Therms per retort per day	143·0	

Steam—
Average pressure to retorts, 20 lbs. per sq.in.
Average calorific value of gas, 469 B.Th.U.

Proximate analysis of coal:

	P.Ct.		P.Ct.
Moisture	1·1	Coke	72·5
Volatile matter	26·4		
Fixed carbon	63·12		
Ash	9·38		
	100·00		

Coke made per ton of coal carbonized, 16·7 cwt.
Gas analysis—

	P.Ct.		P.Ct.
CO_2	4·8	Total inerts	12·2
C_nH_m	2·0		
O_2	0·5		
CO	13·4		
CH_4	20·4		
H_2	52·0		
N_2	6·9		

Tar and liquor, not taken.

REMARKS.

Coal.—Very large, clean, free from dust; swells at top of retort giving pressure; runs very badly; normal heats not suitable, higher heats wanted completely to carbonize coal and keep make; very bad steaming properties; even on 4 and 3 extractor notches; with heats averaging 1250° C., coke was not completely burnt off.

Coke.—Very large lumps, very dense and hard, very little breeze, very bad for producers; clinkers badly.

Heats.—Higher than usual, and during test two extra retorts had to be put on. Great difficulty experienced in getting retorts away after scurfing.

Test B.—Nuts.

GLOVER-WEST VERTICALS, CLEVEDON.

Date of test.—12 noon, Tuesday, May 7, to 12 noon, May 14.
Duration of test.—One week.

Coal—

Coal carbonized	76	tons
Retorts in action per day, average	5	
Throughput per retort per day	2·17	tons
Average number of teeth per retort	5	

Gas—

Total gas made	1,478,000	c.ft.
Per ton of coal	19,447	,,
Per retort per day	42,228	,,
Therms per ton of coal carbonized	87·7	
Therms per retort per day	190·4	

Steam—
Average pressure to retorts, 15 lbs. per sq. in.
Approximately 15 p.ct. of steam by weight of coal carbonized.
Average calorific value of gas, 451·2 B.Th.U. gross.

Proximate analysis of coal—

	P.Ct.		P.Ct.
Moisture	4·6	Coke	63·6
Volatile matter	31·8		
Fixed carbon	54·1		
Ash	9·5		
	100·0		

Coke (retort house sample) made per ton of coal carbonized, 12·6 cwt.
Gas analysis—

	P.Ct.		P.Ct.
Carbon dioxide	3·3	Total inerts—	
Heavy hydrocarbons	1·7	CO_2	3·3
Oxygen	0·3	O_2	0·3
Carbon monoxide	21·7	N_2	7·2
Methane	16·8		
Hydrogen	49·0		
Nitrogen	7·2		
	100·00		10·8

Tar, 15·1 gallons per ton of coal carbonized.
Liquor, 19·5 gallons per ton of coal carbonized.
Coke to producers, 6·2 cwt. per ton of coal carbonized.

REMARKS.

Coal.—Irregular size, rather dirty; exceptional steaming quality; works fairly well in the retorts, but is inclined to stick.

Coke.—Fair quality, friable, medium size, free burning qualities; fair producer coke.

Heats.—Generally good, and during the test one retort was shut off for scurfing and one retort got hung up owing to deferred scurfing, and had to be masked off.

This was a remarkably good coal for our conditions, and we have every reason to believe that we could (had we had the holder storage) have increased our make per retort considerably by increasing the throughput, and at the same time maintained our quality at 450 B.Th.U.

An experiment we have tried, and one which I think worth mentioning, is that of carbonizing different classes of coal in different parts of the setting. For instance, we tried carbonizing all Somerset coals in one bed and all Midland or Yorkshire coals in the adjoining one. This method enabled us to keep our heats comparatively constant by using only the better-class coke for our producers; it also helped in maintaining a constant quality, the rather high quality made by the bad steaming coal (the Somerset) being reduced by the good steaming coals in the adjoining bed. This method could only be carried out when we had more than one bed at work, and depended on whether we could ensure a constant delivery of the two coals. Our experience was that we ran short of either one or the other, and as a last resort had to mix.

Scurfing.—We have tried scurfing by using steam, and our experience has been that the bottom three-quarters of the retort can be cleared of scurf, but that to remove the scurf from the top portion it is necessary to empty the retort and scurf in the usual manner. We have, however, found this method of scurfing useful when we have been pushed for gas, and we have also used it as a method of regulating the quality. In order to scurf in this manner we reduce the extractors to one or two teeth and increase the steam to seven or eight notches.

Collecting Mains.—We have experienced difficulty with the pitching of these mains, and to overcome this we now pump the first condensate collected from the tar seal back again into the mains. The tar and liquor collected in the tar seal overflow into a large cylindrical vessel fitted with an overflow; the light tar falls to the bottom, and the liquor overflows. The light tar from the bottom of the vessel is pumped continuously through the collecting mains, which are emptied once a shift.

Damper Control.—We have made a small alteration to the control dampers, which may be of interest, particularly to those of you who have had trouble with the dampers becoming burnt-in and immovable. We have had fireclay damper frames made the same size as the original dampers (1 ft. 10 in. by 1 ft.), but having a rectangular opening in the centre 9 in. by 5 in. These are set with fireclay in the place previously occupied by the solid damper. A small tile, 1 ft. 1 in. by 9 in. by 2½ in. is placed on top, and forms the damper. Since adopting these dampers we have had no trouble with fusing. They are more easily moved, and the control of the setting is much simpler and more accurate, and, of course, the cost of renewals is less.

Discussion.

The PRESIDENT asked how the steam to the verticals was measured, and if the nozzles were periodically adjusted. Had any wear been noticed in the retort linings? What was the strength of the liquor, and the water content of the tar? Was any allowance made for the varying labour costs with different coals?

Mr. J. H. PYE (Clevedon) stated that he particularly wished to bring forward two points for discussion—viz., (*a*) the best method of applying the results given in the paper to the purchase of coals; and (*b*) the limitation one had to place on these figures. With regard to (*a*), figures were calculated in pence per 1000 c.ft. of gas made, but account should be taken of the steaming qualities of the various coals and residuals obtained, and their effect on the retort settings. As for (*b*), with various tests on the same coal somewhat different results were obtained. The volatile matter and ash content would vary as much as 10 p.ct. from truck to truck of coal. It was therefore necessary to have prolonged tests (say, 100 tons of coal) somewhat to eliminate errors. These tests formed a useful guide for the purchase of coal, and set up a fairly high standard of efficiency.

Mr. A. MARSDEN (Bristol) observed that the majority of works had various types of carbonizing plant, and were, therefore, not in the happy position of utilizing the whole plant (of one type) for test purposes. In regard to the question of increased steaming, the carbon content of the coke was lowered, and gradually as steaming was increased the CO_2 content of the products crept up. When it was more than 5 p.ct., excessive steaming was indicated. Where vertical coke (made in Woodall-Duckham plant) was used in central heating and slow combustion stoves, it had been found that the sharp edges did not allow of compact packing; and therefore such coke was not the most suitable.

Mr. K. L. CLARK (Weston-super-Mare) stated that the market value of coke depended not only upon the ash content, but upon grading for specific purposes. Higher prices were paid for graded coke.

Mr. S. HAYNES (Bristol) asked whether superheated or saturated steam was used. Were the gas analysis tests snap tests, or were they taken over a period?

Mr. A. BARRETT (Frome), in proposing a hearty vote of thanks to the author, stated that at Frome coal tests were carried out by varying the retort heats to suit the various coals.

Mr. B. F. HARRIS (Trowbridge) seconded the vote of thanks.

Mr. JONES, in reply, observed that the steam supply was governed and measured by reducing valves and nozzles, which were systematically cleaned and adjusted. The labour costs of the verticals did not vary, because the same number of men were employed irrespective of the type of coal used. Where coke was required for stoves and boilers, it was graded, and no complaints had been received as to the packing qualities. Saturated steam was now being used. The superheater which had previously been fixed was not a success. The gas analysis tests were snap tests. To date, no wearing had been noticed in the retort linings, which should last for six or seven years. The strength of liquor obtained was approximately 6 oz., and the water content of the tar about 5 p.ct.

Register of Patents.

Rotary Gas Compressors.—No. 317,441.

Steiner, H., of Winterthur.

No. 23,242; July 29, 1929. Convention date, Aug. 16, 1928.

The patentee observes that rotary air or gas compressors give the best volumetric efficiency when there is the minimum axial and radial clearance between the casing and the rotary paddles or vanes. This invention has for its object to render this clearance independent of the varying conditions of working of the compressor, in order to enable it to be always set to the smallest admissible amount. With this object means are provided for enabling the degree of cooling, and therefore also the expansion due to heat of the casing and casing cover, on the one hand, and of the rotary paddles or vanes and shaft, on the other hand, to be varied independently of each other. This is effected by passing, on the one hand, through the casing and casing cover and, on the other hand, through the rotary paddles or vanes and the shaft two currents of cooling medium distinct from each other, and by regulating them singly or jointly and manually or automatically.

Gas Control Valves.—No. 325,890.

South Metropolitan Gas Company, Chandler, D., and Hoxley, H. W., all of 709, Old Kent Road, S.E. 15.

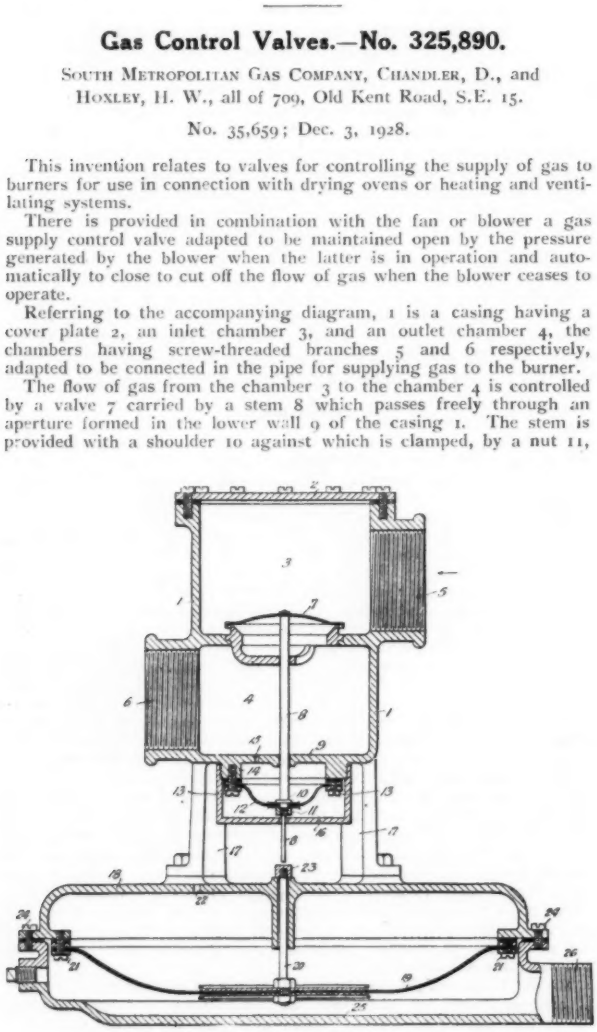
No. 35,659; Dec. 3, 1928.

This invention relates to valves for controlling the supply of gas to burners for use in connection with drying ovens or heating and ventilating systems.

There is provided in combination with the fan or blower a gas supply control valve adapted to be maintained open by the pressure generated by the blower when the latter is in operation and automatically to close to cut off the flow of gas when the blower ceases to operate.

Referring to the accompanying diagram, 1 is a casing having a cover plate 2, an inlet chamber 3, and an outlet chamber 4, the chambers having screw-threaded branches 5 and 6 respectively, adapted to be connected in the pipe for supplying gas to the burner.

The flow of gas from the chamber 3 to the chamber 4 is controlled by a valve 7 carried by a stem 8 which passes freely through an aperture formed in the lower wall 9 of the casing 1. The stem is provided with a shoulder 10 against which is clamped, by a nut 11,



Gas Control Valve.

the central portion of a diaphragm 12, the outer portion of which is clamped by screws 13 to a boss 14 formed on the lower wall of the casing.

The diaphragm chamber is placed in communication with the chamber 4 through an aperture 15. The diaphragm and the clamping means therefor are enclosed by a dished cover plate 16 which screws on to the boss 14, and the lower end of the stem 8 passes freely through an aperture formed in the cover.

The casing is provided with legs or standards 17, bolted to the upper half 18 of a second diaphragm casing, the diaphragm 19 of which is clamped at its central portion to a stem 20 which passes freely through an aperture in the upper half 18, the outer portion of the diaphragm being clamped by screws 21. There is a vent hole 22 to allow free movement of the diaphragm. The outer end of the stem is provided with a head 23, adapted to contact with the lower end of the stem 8 and adapted also to limit the downward movement of the diaphragm 19.

The upper half 17 of the diaphragm casing is secured by screws 24 to the lower half 25, which is provided with a screw-threaded branch 26 adapted to be connected to a pipe branched from the pipe in communication with the fan or blower.

In operation, when the fan or blower is started up, the lower surface of the diaphragm 19 is subjected to the pressure generated thereby, and raised; the stem 20, which is fast with the diaphragm, also rises, whereby the stem 8, and with it the valve 7, is raised to allow gas to flow to the burner through the pipe in which the casing 1 is connected. If the fan or blower ceases to operate, the pressure below the diaphragm 19 falls, and the diaphragm drops, thus allowing the valve 7 to move into engagement with its seating to cut off the supply of gas to the burner. The whole arrangement, which is most accessible, enables a very small force to move the stems, and thus provides a very sensitive control capable of operation with a few tenths of an inch of air pressure.

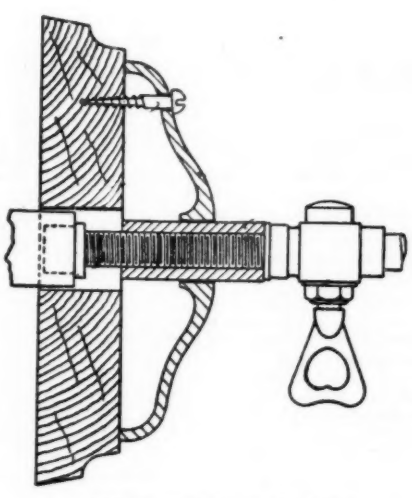
Gas Brackets.—No. 325,923.

South Metropolitan Gas Company and Ellis, H. G., both of 709, Old Kent Road, S.E. 15.

No. 38,064; Dec. 24, 1928.

This invention relates to gas brackets of the type in which a plate is provided for concealing the joint between the service gas pipe and the bracket. In gas brackets as hitherto usually constructed, the plate is integral with the bracket, with the result that the joint between the service pipe and the bracket is concealed by the back plate after it has been made. Moreover, there is a possibility that the bracket arm may be strained during the screwing operation, to effect the joint; and further, if the plate be not truly circular or concentric, the base or wall block usually provided will be scored.

The object of the present invention is to provide a gas bracket in



Gas Bracket with Sliding Plate.

which these disadvantages are overcome and the fixing and joint testing operations facilitated.

The plate is slidably and non-rotatably mounted on the fitting, whereby the securing of the plate to a wall plate or ceiling rose serves also to secure the fitting in the correct position, and whereby the plate can be moved forwardly to enable the end of the fitting to be exposed and the joint with the service pipe to be effected by applying a tool to the end. After the joint has been made, it is readily capable of being tested whereafter the plate can be moved up to the base of the wall block and secured thereto, the joint thus being concealed.

The invention is illustrated in the accompanying drawing.

Gas Ovens.—No. 325,922.

Stoves, Ltd., and Richardson, W. H., both of Rainhill.

No. 37,895; Dec. 22, 1928.

This invention relates to the arrangement and construction of the framework constituting the oven proper, the object being to enable the parts to be readily assembled together prior to mounting the upper frame carrying the various boiling and grilling devices.

The chief feature resides in the provision of a dome which receives on its lower face the linings of the sides and back of the stove, and in turn receives on its upper face the top plate provided with the usual bridges for carrying the hotplate. From the point of view of sealing the oven, state the patentees, this is a distinct improvement on the known constructions where the top plate is supported by the linings themselves, which, of necessity, are cut away along a portion of their length, while the dome contacts at its edges with the faces of such linings.

The base frame and the front and back frame are provided with horizontal and vertical grooves respectively to receive the side panels of the oven and the curved top member or dome adapted to tie the front and back members and side panels together.

The bottom frame member of the oven, which is secured to legs in the usual way, is provided with grooves on its upper face to receive the lower ends of separate side panel units, while the front and back members (constituting the frame to which the oven door is hinged and the back provided with the outlet for the products of combustion) are provided with vertical grooves for the reception of the vertical edges of the side panels.

A further feature of the invention has reference to the construction of the side panels. These are made in the form of shallow box units preferably of sheet metal and usually from two plates, one of which is flanged all the way round for the reception within the flanges of the second plate. If desired, the back frame unit may also be provided with a removable panel of a similar character.

In assembling the parts of the oven together, the supporting legs are secured to the base frame in the usual way. The back of the oven is then fixed rigidly to the base frame, also in the usual manner, after which the structure is arranged with its back at an angle to the horizontal for the convenient assembly of the side panels and the front of the oven. The side panels are provided at their back vertical edges with fireproof putty, and the panels arranged in position, after which the lower end of the oven front is loosely placed in position and held by screws and nuts.

The front edges of the panels or the grooves in the front frame member and the top edges of the panels or the grooves in the oven top or dome are provided with fireproof putty. Similar putty is placed at the rear top portion of the back or the flange at the back of the dome and at the front edge of the dome, after which the top or dome itself is dropped into position vertically, so that its side grooves firmly hold the top edges of the side panels in position.

The screws securing the front of the oven to the base frame are then tightened up, after which screws or bolts are passed through the top end of the front of the oven and the front edge of the dome, similar screws or bolts being passed through the top end of the back of the oven and the rear flange of the dome. By tightening these screws up, the front and back and side panels are firmly secured together, the putty making tight joints between the parts. An important advantage in arranging the dome in the manner described is that it secures the front and back and side panels firmly at right angles to each other, taking off all strain from the bolts or securing screws by which they are connected together.

Safety Device for Gas Taps.—No. 326,371.

P. A. O. EWING, of Chester.

No. 10,540; April 5, 1929.

This safety device is in the form of a clip adapted to be detachably secured to the arm of the tap and secured by a spring to an adjacent wall or floor, or to the pipe or a platform or bracket provided to engage therewith. Thus the clip may be fitted over the tap and may be connected to a spiral spring which may be secured at one end by a staple or the like to the wall or floor. The tap may be operated as desired after removal of the clip. Suitable spring or other locking means may be provided for detachably securing the clip to a floor or wall adjacent. If desired, and if the pipe is accessible, the spring may be anchored at the fixed end to the pipe or to a clip secured to the pipe.

Heating of Coke Ovens.—No. 326,094.

P. E. VERPEAUX and UNION CHIMIQUE BELGE, SOCIETE ANONYME, both of Brussels.

No. 14,526; May 9, 1929.

The following claims are made for this invention:

1. Horizontal coke ovens having heat regenerators and vertical heating flues, provided with auxiliary flues by means of which air is distributed to various levels of the heating flues, in order to produce supplementary and successive combustions of the gas admitted at the lower part of the heating flues, characterized in that underneath each auxiliary flue is placed a suction and blowing device made of refractory material receiving in its nozzle air under pressure, which aspirates into the auxiliary flue, through a side pipe, air which has been heated in the regenerators of the corresponding oven.

2. Coke ovens as claimed in claim 1, characterized in that the pressure of the air admitted into the nozzle of the suction and blowing device can be regulated at will, thus regulating at will the flow of the air which serves for the supplementary combustions in the heating flues.

The invention is illustrated in the specification.

Applications for Patents.

[Extracted from the "Official Journal" for March 26.]

Nos. 8473—9283.

BARTLETT, E. E.—"Gas stove." No. 8631.
GLOVER & CO., LTD., T.—"Coin-freed mechanism for gas meters." No. 8544.
HICKISCH, I. J.—"Gas burner for coal-heated stoves." No. 8598.
RADIATION LTD.—"Water-heating apparatus." No. 8813.
SMITH, H.—See Radiation Ltd. No. 8813.
THWAITE, A. H.—"Carbonization of coal." No. 8816.
WILSON, D. L.—"Prepaid gas meters." No. 8759.
WILSON, J. S.—See Glover & Co., Ltd., T. No. 8544.

[Extracted from the "Official Journal" for April 2.]

Nos. 9284—10,108.

BAMAG-MEGUIN AKT.-GES.—"Automatic reversing apparatus for controlling closure members of gas producers, &c." No. 9800.
BRANDT, R.—"Method of obtaining potassium, &c., in purification of coal gas." No. 9292.
CHANDLER, D.—"Quick- release gas unions." No. 10,023.
CUTLER, S.—"Gasholders." No. 9932.
DAVIES, A. E.—"Gas burner injectors." No. 10,048.
GAS LIGHT AND COKE COMPANY.—"Destructive hydrogenation of hydrocarbons." No. 10,066.
GAS LIGHT AND COKE COMPANY.—"Manufacture of anthracene, &c., derivatives from crude coal-tar fractions." No. 10,067.
GAS LIGHT AND COKE COMPANY.—"Conversion of hydrocarbons." No. 10,068.
GLOVER & CO., LTD., T.—"Gas meters." No. 9350.
GRIFFITH, R. H.—See Gas Light and Coke Company. Nos. 10,066, 10,067, 10,068.
INTERTRUST COMPAGNIE GENERALE DE DISTILLATION ET COKEFACTION A BASSE TEMPERATURE ET MINIERE SOC. ANON.—"Low-temperature carbonization, &c." No. 9860.
LUCKHURST, T. W.—"Radiants for gas fires." No. 9397.
MCINTOSH, W. B.—See Glover & Co., Ltd., T. No. 9350.
MASCHINENFABRIK AUGSBURG-NURNBERG AKT.-GES.—"Liquid seal for waterless gasholders." Nos. 9630, 9631.
MIDLAND COKE RESEARCH COMMITTEE.—"Manufacture of coke." No. 9815.
MOTT, R. A.—See Midland Coke Research Committee. No. 9815.
POOLE, D. C. E.—"Gas meters." No. 9465.
REGENT MALLEABLE CASTINGS, LTD.—See Davies, A. E. No. 10,048.
SIMPSON, S.—"Coin-freed mechanism for gas meters." No. 9820.
SOUTH METROPOLITAN GAS COMPANY.—"Water conveyors for coke, &c." Nos. 9554, 9555.
SOUTH METROPOLITAN GAS COMPANY.—See Chandler, D. No. 10,023.
WHEELER, R. V.—See Midland Coke Research Committee. No. 9815.
WILLEY & CO., LTD.—See Simpson, S. No. 9820.
WILSON GAS METERS, LTD., G., and WILSON, J. H.—See Poole, D. C. E. No. 9465.

Parliamentary Intelligence.

[From Our Special Correspondents.]

House of Lords.

Special Orders.

The Bideford and Oxford Gas Orders were scheduled for consideration by the Special Orders Committee yesterday.

Private Bills.

The South Staffordshire Mond Gas Bill passed its Third Reading, and is now awaiting Royal Assent.

The Petition of the Gas Light and Coke Company against the Middlesex County Council Bill is now being heard in Committee. The Petitioners object to Clause 5 of the Bill, which would restrict the Company's Statutory right to break up roads in respect of a certain portion of the North Circular Road.

House of Commons.

Special Orders.

Plans and estimates of expense have been deposited in connection with the Hartlepool Gas and Water Order.

Private Bills.

The Brighton and Hove Gas Bill has passed the Report Stage, and was put down for Third Reading on Monday last. The Petitions of the Croydon Gas Company against the Croydon Corporation Bill, and of the Kingston-on-Thames Gas Company against the Southern Railway Bill, have been withdrawn.

Coal Mines Bill.

On the Report Stage of the Coal Mines Bill, Captain Austin Hudson moved the insertion of a proviso to prohibit any undue preference in the matter of prices in respect of coal used for carbonization or gasification. After considerable discussion the Amendment was rejected by 268 votes to 202. The Bill has now passed its Third Reading, and is awaiting discussion in the House of Lords.

Legal Intelligence.

Luton Gas Company Appeals Against Assessment.

Over two hours were taken on Thursday last by the Luton Area Assessment Committee in hearing an appeal by the Luton Gas Company against the assessment of their undertaking. Mr. W. J. Primett presided.

Sir Trustram Eve supported the assessment, and the appellants were represented by Mr. J. A. Southern, of Messrs. Ryde, Sons, & Browne, chartered surveyors, London. Mr. Southern was accompanied by Mr. William Phillips, Secretary and Manager to the Company.

The assessments according to the valuation list were: Gas-works and mains in the borough, £8755, which the appellants sought to alter to £3719; mains in the added part of Leagrave, £142, which the appellants sought to alter to £42; mains in the added part of Limbury, £142, which the appellants sought to alter to £41; mains in the parish of Stopsley, which the appellants sought to alter to £17.

The grounds of the appeal were that the gross value, net annual value, and/or rateable value of the hereditament were not correctly inserted in the list or proposal; that the gross value, net annual value, and/or rateable value at which the hereditaments were valued were in excess of the true value of the property; that the property was unfairly assessed and unequally assessed by comparison with other properties in the parish.

The appeal first came before the Committee last October, when the Gas Company submitted Messrs. Ryde, Sons, and Browne's estimate of the rateable value based on the Company's accounts for 1928. These accounts showed gross receipts at £132,700; working expenses *ex* rates, the receipts from residuals being deducted from the cost of coal, £86,570, *less* depreciation, £2000, £84,576; maintenance of works and mains on a five years' average, £26,020. This showed net receipts, *plus* rates, at £22,104, from which was deducted 15 p.ct. on the tenant's capital of £100,000, which gave a rateable value, *plus* rates, of £7104. Rates calculated at 10s. in the pound were shown at £2368, which, on this basis, gave a total rateable value of £4736.

On Thursday new figures were submitted by the Gas Company, working expenses being shown at £83,398, and the tenant's capital at £120,000, which reduced their estimate of the rateable value of works and mains to £3378.

The Company also submitted a comparison with the Bedford Undertaking. This showed the gross profit of the two undertakings to be almost the same. The rateable value put on the two undertakings disclosed that the cost to Luton worked out at 0·66d. per therm and to Bedford at 0·48d. Messrs. Ryde, Sons, & Browne submitted that if Luton were assessed at 0·48d. per therm the rateable value of the undertaking would be £6627 instead of £9100.

The hearing was adjourned in October to give Sir Trustram Eve an opportunity of inspecting the books of the Company, and on Thursday Sir Trustram acknowledged Mr. Phillips' courtesy in facilitating this work.

Sir Trustram Eve asked Mr. Southern if he thought the assessment of the Bedford Undertaking was right or was too low.

Mr. Southern: I am prepared to accept it as right, and on that basis I say we are too high.

Mr. Southern submitted that the rateable value should be governed by a sliding-scale and by the Luton Gas Company's Acts.

The possibility of an appeal to Quarter Sessions was hinted at during the proceedings, if the Gas Company's submissions were not accepted.

Sir Trustram Eve dealt in great detail with the accounts of the Company.

The Committee reduced the rateable value from £9100 to £8461.

Assessment of the Garforth Undertaking.

Before the West Riding Quarter Sessions Rating Appeals Committee, sitting at Wakefield on March 31, the Garforth Gas Consumers Company, Ltd., appealed against the assessment of their undertaking by the Barkston Ash Assessment Committee and the Garforth Urban and the Tadcaster Rural rating authorities.

Mr. F. Grant, for the Company, urged that the rateable value of the undertaking, on which the assessment was based, was too high. He contended that the £452 total assessment was much too high and should be reduced to £274, or alternatively £236.

Mr. *Howard Collins*, of Westminster, called by the Gas Company, said there were 13¼ miles of mains and only 103 consumers per mile of main—one of the great drawbacks under which this undertaking, serving a scattered area, had to work. Electricity competition was keen and meant a loss to the Gas Company of £520 to £530 in re-

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ceipts. They had not lost any individual consumers, but had lost the street lighting.

The Assessment Committee called Mr. Gerald Veale, chartered accountant, of Harrogate, as their expert witness, but the Court allowed the appeal, fixing the rateable value at £330.

Postal Losses of the Institution of Gas Engineers.

Sidney Clifford King was bound over for twelve months at the Rochester Row Police Court on April 2, on a charge of stealing a postal packet containing £3 in currency notes from the Institution of Gas Engineers at 28, Grosvenor Gardens, S.W. 1.

Mr. *J. R. W. Alexander*, the Secretary of the Institution, in giving evidence said that numerous letters had been lost since the beginning of the year. The General Post Office having reported, after extensive inquiry, that responsibility could not reasonably be attributed to them, he called in the Criminal Investigation Department and arranged for the dispatch of a test letter, the theft of which was traced to King, who confessed to the whole of the irregularities. King was employed by the House Committee, representing the Institution and the other tenants of 28, Grosvenor Gardens, for whom he sorted the morning post.

Mr. Alexander, on behalf of the Institution of Gas Engineers, asked the Magistrate's permission publicly to thank the Investigation Branch of the General Post Office and the Criminal Investigation Department for the efficient, expeditious, and courteous manner in which the matter had been handled.

Gas Acts (1920 and 1929) Orders.

ORDER UNDER SECTION 1.

Long Eaton Gas Company.

To authorize the Company to borrow not exceeding four-fifths of the aggregate amount of the paid-up share capital and any premiums thereon.

DECLARATIONS OF CALORIFIC VALUE.

Grange and Cartmel District Gas Company.—450 B.Th.U. (April 1.)

Watford and St. Albans Gas Company (St. Albans District).—500 B.Th.U. in substitution for 475 B.Th.U. (July 1.)

SECTION 6.

Stone Gas and Electricity Company, Ltd.

The Company are to supply gas on the thermal basis, and the standard price is to be 9d. per therm.

SPECIAL ORDER.

Glastonbury Corporation.

To extend the limits of supply, to authorize the use of scheduled land for gas purposes, and to confer general powers.

DECLARATIONS OF CALORIFIC VALUE.

Chesham and District Gas Company.—500 B.Th.U., in substitution for 480 B.Th.U. (July 1.)

Penistone and District Gas Company.—475 B.Th.U. (July 1.)

Prescot and District Gas Company (Rainhill District).—450 B.Th.U. (July 1.)

Stone Gas and Electricity Company, Ltd.—500 B.Th.U. (April 1.)

Gas Exhibition at Ramsey.—The Ramsey (I.O.M.) Gas Light Company, Ltd., have had a very successful fortnight's exhibition. Miss Kathleen Eason's cookery lectures proved exceedingly popular, while great interest was also shown in the sideshows of Radiation cookers, Main cookers, and Bray burners, for all of which many sales were recorded.

An Accident Prevention Service.—The National Safety First Association have just inaugurated a special accident prevention service for industrial undertakings. Briefly, this consists of an intensive campaign each month against one of the principal risks of industry. The series starts with "Handling Goods." Weekly posters deal with various aspects of that particular risk, which is the most prolific of accidents. These are reinforced by special bulletins for the management, and pocket magazines, "On Guard," for the worker. "Fifteen thousand men, women, and children were killed last year in accidents." So writes Mr. J. R. Clynes, M.P., the Home Secretary, in the first monthly message in "On Guard." "You and I," he concludes, "know how easily the majority of accidents can be avoided if only everybody is out to help. This new magazine is designed primarily for distribution to workers in industrial and transport undertakings, and covers various aspects of health as well as safety at work, in the street, and even in the home. Other contributors include the Hon. Sir Arthur Stanley, Sir Arbuthnot Lane, Sir Gerald Bellhouse, and Sir Felix Pole. Mr. Walter Citrine gives an open letter, in which he says: "Our responsibility for an accident which we might have prevented is morally as great as if we had actually caused it." A sample copy of the magazine can be obtained, price 2d., post free, or quotations for quantities will be given by the National Safety First Association, 119, Victoria Street, London, S.W. 1.

Gas Companies' Results in 1929.

Good Business in All Directions.

BRIDGWATER.

The 96th Ordinary General Meeting of the Bridgwater Gas Light Company was held at the offices of the Company, High Street, on Tuesday, March 25—Mr. T. Eveleigh, Chairman of the Directors, presiding. Moving the adoption of the Directors' report and the statement of accounts, the Chairman said he was pleased to be able to report another successful and satisfactory year of trading. The total sales of gas was a record, as also was the increase on the year a record. The total sales were 134,933,700 c.ft., as against 124,690,700 c.ft. in 1928, a difference of 10,243,000 c.ft., representing 8¼ p.ct. increase. A large part of that was no doubt attributable to the severe wintry weather in the early months of last year, but what was more to the purpose was the gratifying feature that in 1929 they added 336 new customers on their books, which was most encouraging. The loan capital authorized was now £51,000; the previous amount was £42,000. There was £1380 of debenture stock unissued, and now available at 98 per £100 stock, and he ventured to suggest to any who might be seeking a safety-first investment that it offered a good first-class investment with a good return for interest and ample security. In relation to the increased demand on their works it was informative and interesting to note that during the last decade the number of their customers had increased by 1413, while gas made last year totalled 33 million c.ft. in excess of the total for the year 1920.

HEMEL HEMPSTEAD.

During 1929, the Hemel Hempstead District Gas Company sold nearly 143 million c.ft. of gas—an increase of over 5 p.ct. on the sales for the previous year. This was one of the matters referred to by Mr. S. Cutler in his address as Chairman of the Company at the annual meeting on March 23, when it was decided to declare dividends for the year of 10 p.ct. on the "A" and "B" stocks, 7 p.ct. on the "C" stock, and 6 p.ct. on the preference stock, subject to income-tax. This leaves £5204 to be carried forward. "During the whole of last year," said Mr. Cutler, "we were engaged in the building of an entirely new retort house, which is quite modern in all respects. We have made ample allowance for future extensions, and we are pleased to be able to report that since early in last December, when the new retort house commenced to make gas, the working has entirely fulfilled our expectations."

LAURENCEKIRK.

Mr. John Adam, Chairman, presided at the Annual Meeting of Laurencekirk Lighting Society, Ltd., when a report read by the Secretary was adopted. The report showed that, after providing for depreciation, the profit on the year's working amounted to £119 7s. 10½d. In moving the adoption of the report, the Chairman stated that the returns from the sale of gas were lower than last year, but that this was accounted for by the reduced charges. The Society had paid, he said, £118 in local rates and £103 in taxes.

LEAMINGTON PRIORS.

The 130th Ordinary General Meeting of the shareholders of the Leamington Priors Gas Company was held at the Gas-Works on Tuesday, March 25—the Chairman (Dr. Harold Mason, J.P.) presiding. The Chairman considered that the Company's report generally was satisfactory bearing in mind the mildness of the second half of 1929, and although this had brought about a slight reduction in output for the half-year there had been an increase of about 4 p.ct. during the calendar year 1929, or practically the same as had obtained generally throughout the country. The shareholders would be interested to know that during the last ten years the output of gas had increased by over 40 p.ct. which augured well for the future of the undertaking. The reduction in rates and taxes was due partly to a refund of income-tax through the Inland Revenue allowing a proportion of the cost of the new retort house to be charged as a replacement. In round figures £27,000 had been paid towards the cost of the new installation, leaving £17,000 owing. The drop in revenue from bye-products was unfortunate but general throughout the country, and had somewhat counterbalanced the savings brought about through the introduction of the vertical retort installation. The adoption of the report recommending the payment of the usual dividends and the accounts was proposed by the Chairman, seconded by Dr. Haynes, and carried.

ROTHWELL.

At the Half-Yearly Meeting of shareholders of the Rothwell (Leeds) Gas Light Company held on March 31, Mr. George Armitage (Chairman), presiding, stated that the Company had had a record half-year, the increased sales of gas being 6½ p.ct. In moving the adoption of the maximum dividends at the rate of 10 p.ct. per annum on the original and 7 p.ct. per annum on the additional capital, the Chairman stated that the results showed a steady progress. During the past ten years the sales had increased by over 56 p.ct., and since 1924, despite competition with electricity, the output had increased 12½ p.ct. In moving a vote of thanks to the officials and workmen, he said that in their Manager, Mr. Lewis Shaw, they had an official whose energies never appeared to slacken, in fact he seemed to have a perfect mania for gas. Mr. Shaw, in responding for the officials and workmen, paid a tribute to the Directors, who, he informed the shareholders, were not content to meet once a month, but met every fortnight; and with such encouragement as he received from the Board of Directors, work became more of a pleasure. He had every confidence in the future of the gas industry, and this Company in particular.

SLOUGH.

At the Annual Meeting of the Slough Gas Company great stress was laid on the rapid progress which has been made during the last four years. Mr. R. V. Elvey occupied the Chair. The report referred in detail to the extensions which have taken place during the past year at the works, and the additional plant laid down to cope with the ever-increasing demand for the supply of gas. It also showed that owing to these extensions the Company was overspent, on Dec. 31 last, to the extent of £35,681, which made it necessary to raise an additional £40,000 capital. The revenue account showed that the income from the sale of gas, &c., amounted to £59,403 (an increase of over £5000 on the previous year), residual products £11,033, the total income being £70,645. The total expenditure was £54,903, leaving a balance to be carried forward to the profit and loss account of £15,742. The actual manufacture of gas cost £36,335 and the distribution £9665. Rents and rates amounted to £2875, and management £2627. The sum of £200 was set aside for the pensions fund, £484 for co-partnership, £347 National Insurance, £249 cost of special order, and £1000 to the special purposes fund. The Chairman, in moving the adoption of the report and balance-sheet, said that the sale of gas amounted to 1,098,719 therms, or equivalent to 219,743,800 c.ft., an increase of 146,414 therms or 29,282,800 c.ft. This was equivalent to an increase of 15·3 p.ct., the biggest increase they had ever had. There were also 425 additional consumers. The nearest approach they had to this increase was in 1926, the year of the great coal stoppage. In that year they had an increase of gas sold of 22,373,200 c.ft. (111,866 therms), which was 7,000,000 c.ft. less than last year. When they talked of increases they had to remember that these were accumulative over previous years. If they looked back over the last four years, 1926-27-28-29, they had the almost startling fact that the business of the Company had increased by no less than 55 p.ct. This showed that they were making very rapid strides. In the last report the Directors told the stockholders that they had to provide new works and plant to cope with the increasing business. This was not quite finished at the end of the year, but he was pleased to say that the engineer reported to-day that it was now absolutely completed, and the last workman had left the premises.

TORQUAY AND PAIGNTON.

The Seventy-First Annual General Meeting of the Torquay and Paignton Gas Company was held at the offices of the Company in Fleet Street, Torquay, on March 24—the Chairman (Major R. P. Kitson, J.P., C.A.) presiding. The Chairman said: The steady progress of the Company's business has again been maintained, and the demand for gas continues to expand. An increased sale of nearly 24 million c.ft. has been recorded, and the total sale for the year amounted to 563 millions. This continued expansion affords striking evidence of the stability of our undertaking, and the popularity of our primary product. As a result of this development, it has become necessary to augment the storage capacity of Hollacombe, and the Directors have decided to instal a 1½ million c.ft. holder in order to be in a position adequately to meet the requirements. The revenue from coke shows an increase as compared with the previous year, and stocks are low. The coke grate has met with very considerable success, and its introduction has undoubtedly assisted in the development of local sales. A further reduction in price of ¼d. per therm, or nearly 2½d. per 1000 c.ft., will take effect as and from the reading of the meters for the March quarter. The reduced price of gas will now be 3s. 4·8d. per 1000 c.ft., being the lowest price since 1914.

WIMBORNE.

The Ordinary General Meeting of the shareholders of the Wimborne Minster Gas Company, Ltd., was held at the King's Head Hotel, Wimborne, on Tuesday, March 25, when Mr. R. T. S. Seymour (Chairman of the Board of Directors) presided. The Directors presented the annual balance-sheet and statement of accounts for the past year. A reference to the profit and loss account indicated that after payment of the interim dividend in October last there remained a balance of £4867. The Directors recommended that a dividend be declared at the usual rate of 3 p.ct. on the preference shares; 7½ p.ct. on the ordinary shares; and £5 5s. p.ct. on the additional ordinary "B" shares for the half-year ended Dec. 31 last, *less* income-tax; that a sum of £25 5s. be carried to the reserve fund and that the balance be carried forward. The sale of gas during the past year, which amounted to 41½ million c.ft. again constituted a record—this being an increase of 5 p.ct. on the previous year—and the Directors congratulated the shareholders on the continual expansion of the Company's business. In pursuance of their policy of supplying gas to the public at the cheapest possible rate, the Directors had again reduced the price at the last New Year from 9d. to 8·4d. per therm, equal to 3s. 6d. per 1000 c.ft., which low figure they considered would tend to still further popularize the use of gas for all purposes. The Chairman, in moving the adoption of the report and balance-sheet, mentioned that the price charged for gas in Wimborne was an exceedingly low one for companies of this size anywhere in the South of England, and the last reduction at the New Year makes the price still more marked. The cost of these continuous reductions in the price of gas had been reflected in the reduced amount of net profit account during the year, but despite this fact the Company's business was in a very sound and suitable condition. By the passing of the Gas Undertakings Act, 1929, the powers of the Company for the raising of loan capital had been automatically increased from £4250 to £8500.

XUM

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex Dividend.	Dividends. Pr. v. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Apl. 4.	Rise or Fall on Week.	Transactions Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
171,978	Stk.	Feb. 6	5	5	Aldershot 5 p.c max. C. .	73–78	..	74–76
522,992	,,	,,	4	4	Do. 4 p.c. Pref. . .	70–73	..	..
1,551,868	,,	Apl. 3	7½	7½	Alliance & Dublin Ord. . .	90–93*	–3	..
374,000	,,	Jan. 9	4	4	Do. 4 p.c. Deb. . . .	60–63	..	..
622,655	,,	Mar. 6	7	7	Barnet Ord. 7 p.c. . . .	109–112	..	..
300,000	1	Oct. 24	1/4½	1/4½	Bombay, Ltd	16/– 18/–	..	16/4½–16/9
174,500	10	Mar. 6	9	9	Bournemouth 5 p.c. . . .	13–14	..	..
500,050	10	,,	7	7	Do. 5 7 p.c. . . .	12½–12¾	..	..
430,460	10	,,	6	6	Do. Pref. 6 p.c. .	10¾–11¼	..	..
50,000	Stk.	Dec. 19	3	3	Do. 3 p.c. Deb. . .	55–58	+2	55–56
162,025	,,	,,	4	4	Do. 4 p.c Deb. . .	74–77	+2	..
357,300	,,	Mar. 20	7½	7½	Brighton & Hove 6 p.c. Con.	113 116	..	..
171,880	,,	,,	6¾	6¾	Do. 5 p.c. Con.	100–103	..	..
1 287 500	,,	Feb. 20	5	5	Bristol 5 p.c. max. . . .	87½–88½a	+1	..
855,000	,,	Apl. 3	7	8	British Ord.	110–115	–2	111½–112
100,000	,,	Dec 19	7	7	Do. 7 p.c. Pref. . . .	109–114	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. . .	69–71	..	..
450 000	,,	,,	5	5	Do. 5 p.c. Red. Deb. . .	92–95	..	..
100 000	,,	Jan. 9	5	5	Cambridge 5 p.c. Deb. . .	90–93	..	..
100 000	10	Dec 5	8	6	Cape Town, Ltd	8¾–9¼	..	..
100 000	10	Nov. 7	4½	4½	Do. 4½ p.c. Pref. . .	6¾–7½	..	..
150,000	Stk.	Dec. 19	4½	4½	Do. 4½ p.c. Deb. . .	69–74	..	..
626 860	,,	Feb. 20	6	6	Cardiff Con. Ord. . . .	96–99	..	96¾
237 860	,,	Jan. 9	7½	7½	Do. 7½ p.c. Red. Deb. .	98–101	..	..
157,150	,,	Feb. 20	5	6½	Chester 5 p.c Ord. . . .	87½–92½b	..	..
98 936	1	Oct. 10	†2/–	†2/–	Colombo, Ltd. Ord. . . .	34/–36/–	..	..
24 495	1	,,	1/1½	1/4½	Do. 7 p.c. Pref. .	19/–21/–	..	..
375,402	1	Apl. 3	1/9½	1/9½	Colonial Gas Assn. Ld. Ord	20/–22/–*	–/6	..
187,848	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	19/–21/–*	–1/–	..
2,073,280	Stk.	Feb. 20	5	7	Commercial Ord.	87–92	..	88–89
475,000	,,	Dec. 19	3	3	Do. 3 p.c Deb. . .	57–60	..	58
787,560	,,	Feb. 20	7	7	Croydon sliding scale. . .	104–107	+1	104½–105¾
453,100	,,	,,	5	5	Do. max. div. . . .	83–86	..	..
542.270	,,	Mar. 6	7	10	Derby Con.	4 5–125e	..	..
55,000	,,	Dec. 19	4	4	Do. Deb.	67–70e	..	..
209 000	,,	Mar. 6	5	5	East Hull Ord. 5 p.c. . . .	71–73	..	..
1 002,180	10	Mar. 20	¼	†7	European, Ltd.	14½–15¼*	+1¾	13¾–15¼
18 629,125	Stk.	Feb. 20	5¾	5¾	Gas Light & Coke 4 p.c. Ord.	19/–19/6f	+–/1½	18/10½–19/4½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max. . . .	62½–64½	..	63½ 64
4,157 020	,,	,,	4	4	Do. 4 p.c. Con. Pref. . .	77–80	..	77½–78½
5,602,620	,,	Dec. 19	3	3	Do. 3 p.c. Con. Deb. . .	58–61	..	59–60
2,642.770	,,	,,	5	5	Do. 5 p.c. Red. Deb . .	98–101	..	100
82,500	,,	Mar. 20	7	7	Hastings & St. L. 5 p.c. Conv.	96–101	..	98 100
258.740	,,	,,	5½	5½	Do. 3½ p.c Conv.	78–83	..	80
70 600	10	Oct. 10	†10	†10	Hongkong & China, Ltd. .	13¾–14¾	..	..
213,200	Stk.	Mar. 6	6	6	Hornsey Con. 3½ p.c. . . .	90–93	..	92½–93
1,976,000	,,	Nov. 1	20	10	Imperial Continental Gas. .	385–405	+15	381½–401
223,180	,,	Feb. 6	3¼	3¼	Do. 3½ p.c. Red. Deb.	75–85	+7½	..
235,242	,,	Mar. 20	8½	8½	Tea Bridge 5 p.c. Ord. . .	112–115	..	..
2,145,907	,,	Feb. 20	6	6	Liverpool 5 p.c. Ord. . . .	89¼–90½b	..	..
600 000	,,	Mar. 20	7	7	Do. 7 p.c. Red Pref..	99–101b	+1½	..
165,736	,,	Feb. 20	9	8	Maidstone 5 p.c. Cap. . .	119 124	..	..
68,480	,,	Dec. 19	3	3	Do. 3 p.c. Deb. . .	52–55	..	..
75,000	£	Dec. 5	†10	†10	Malta & Mediterranean . .	5½–6	..	..
392,000	—	Apl. 1	5½	5½	Metrop'itan (of Melbourne) 5½ p.c. Red. Deb. . . .	90–93*	–2	..
541,920	Stk.	Nov. 21	†9	†6	Montevideo, Ltd.	107–112	..	110–111
2,061,315	,,	Feb. 20	5	5½	Newcastle & Gateshead Con.	15/6–16/3df	–/1½	..
682,856	,,	,,	4	4	Do. 4 p.c. Pref. .	70–71d	+½	..
691,705	,,	Dec. 19	3½	3½	Do. 3½ p.c. Deb. .	66½–67½d	..	..
169,940	,,	Mar. 6	7½	7½	North Middlesex 6 p.c. Con.	109–114	..	..
396,160	,,	Feb. 6	5	5	Northampton 5 p.c. max. .	74–77	..	..
300.000	,,	Nov. 21	7	9	Oriental, Ltd.	108–113	..	111–113
60,000	.5	13 My., '15	—	—	Ottoman	0–¼	..	..
205,162	Stk	Jan. 9	8	8	Plym'th & Stonehouse 5 p.c.	107 110	..	..
424,416	,,	Feb. 20	8	8	Portsm'th Con. Stk. 4 p.c. Std	110–115	..	..
241,446	,,	,,	5	5	Do. 5 p.c. max. . .	78–81	..	..
2,334,464	1	June 27	—	15	Primitiva Ord.	28/–30/–	..	..
244,500	100	Dec. 2	4	4	Do. 4 p.c. Red. Deb. . .	92–95	..	..
695,000	Stk.	Jan. 23	4	4	Do. 4 p.c. Red. Deb. 1911	81–84	..	..
4 6.345	,,	Dec. 19	4	4	Do. 4 p.c. Cons. Deb. .	81–84	..	..
150,000	10	Apl. 3	6	6	San Paulo 6 p.c. Pref. . .	8¾–9*	–⅛	..
1,736.968	Stk.	Mar. 20	6½	6½	Sheffield Cons.	102–104e	..	..
95,000	,,	Jan. 9	4	4	Do. 4 p.c. Deb.	76–78e	..	..
90 000	10	June 13	‡4	‡4	South African	4–6	..	4¾–5
6,709.895	Stk.	Feb. 20	5	7½	South Met. Ord.	99–102	+1½	99–101
500,000	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	107–110	..	..
1,895 445	,,	Jan. 9	3	3	Do. 3 p.c. Deb. . .	58–61	+1	58½–60
734,000	,,	Mar. 6	6½	6½	Do. 6½ p.c. Red. Db.	97–99	..	100
91.500	,,	Mar. 20	8½	8½	South Shields Con. . . .	105½–107¾d	..	..
1,543,795	,,	Feb. 20	6½	6½	South Suburban Ord. 5 p.c.	98–101	..	..
468,837	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	92–95	..	..
647.740	,,	Feb. 20	5	5	Southampton Ord. 5 p.c.max.	76–79	..	..
121.275	,,	Dec. 19	4	4	Do. 4 p.c. Deb.	72–75	..	..
179,014	,,	Feb. 20	8	8	Sutton Ord.	113–116	..	..
67,828	,,	Jan. 9	5	5	Do. 5 p.c. Deb. . . .	91–94	..	..
250,000	,,	Mar. 6	7	7	Swansea 7 p.c. Red. Pref. .	98–100	+1	..
200,000	,,	Dec. 19	6½	6½	Do. 6½ p.c. Red. Deb. .	99–101	..	..
1,076,490	,,	Mar. 6	6⅝	6⅝	Tottenham District Ord. .	100 104	..	101½–102
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. . .	95–98	..	..
199,005	,,	Dec. 5	4	4	Do. 4 p.c. Deb. . .	70–73	..	..
182,380	10	30 Dec., '12	—	—	Tuscan, Ltd.	3¾–4¾	..	..
85,701	Stk.	Mar. 20	6	6	Do. 6 p.c. Red. Deb.	75–80	..	75
309,094	,,	Mar. 6	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	94–99	..	..
88,336	,,	,,	5	5	Do. 5 p.c. pref. . .	85–90	..	..
1,180,970	,,	—	—	—	Wandsworth, Wimbledon, and Epsom Cons. . .	107–112	..	..
200,000	,,	Feb. 20	5	5	Do. 5 p.c. Pref.	85–90	..	..
488,344	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	92–97	..	95

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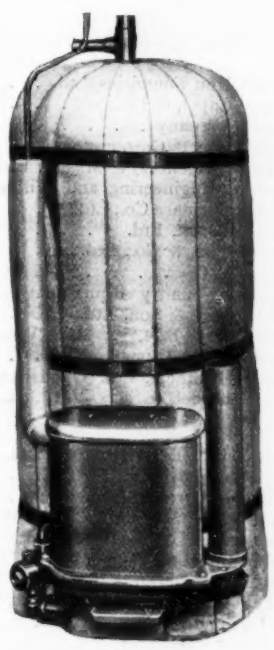

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4. The appointment will be determinable by three months' notice in writing on either side.

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7. The position is a designated post for the purposes of the Local Government and other Officers' Superannuation Act, 1922, and the person appointed will be required to contribute to the Superannuation Fund, and his salary will be subject to a deduction of 5 per cent. for this purpose.

8. *Copies* of not more than Three recent Testimonials should be submitted.

9. Canvassing, either direct or indirect, will disqualify.

10. Forms of applications will not be issued.

11. Applications, endorsed "Borough Gas Engineer and Manager," must be delivered at the Office of the undersigned not later than the 5th May, 1930.

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Town Hall,
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CONTRACT No. 44.

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Persons desirous of tendering are requested to make written application to the Chief Gas Engineer, Gas Works, Etruria, Stoke-on-Trent, not later than Wednesday, April 30, 1930, and to enclose a deposit of £2 Treasury Notes, which will be returned on receipt of a *bona-fide* Tender and the return of all plans and documents, and also provided Tenders are received by the date mentioned.

Sealed Tenders to be forwarded to the undersigned not later than 12 noon on Monday, 12th May, 1930, and endorsed "Contract No. 44, Waterless Gasholder."

E. B. SHARPLEY,
Town Clerk.

Town Hall,
Stoke-on-Trent,
April 7, 1930.

TEIGNMOUTH URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.)

TENDERS FOR COAL.

TENDERS are invited for Coal Supplies for the period August 1, 1930, to July 30, 1931.

Quantity required, 5000 Tons in equal monthly quantities.

Prices to be submitted for Yorkshire and Durham Coal, source of raising to be stated.

No Tender Forms are provided.

Tenders to be received by Monday, April 28, addressed to the Chairman of the Gas Committee, Bitton House, Teignmouth.

H. HIGHAM,
Gas Engineer and Manager.

April, 1930.

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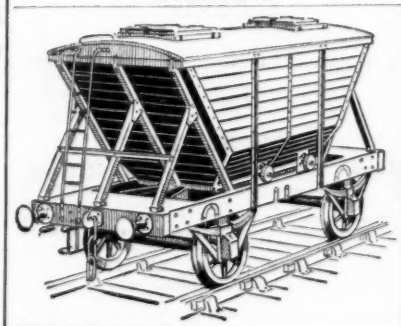

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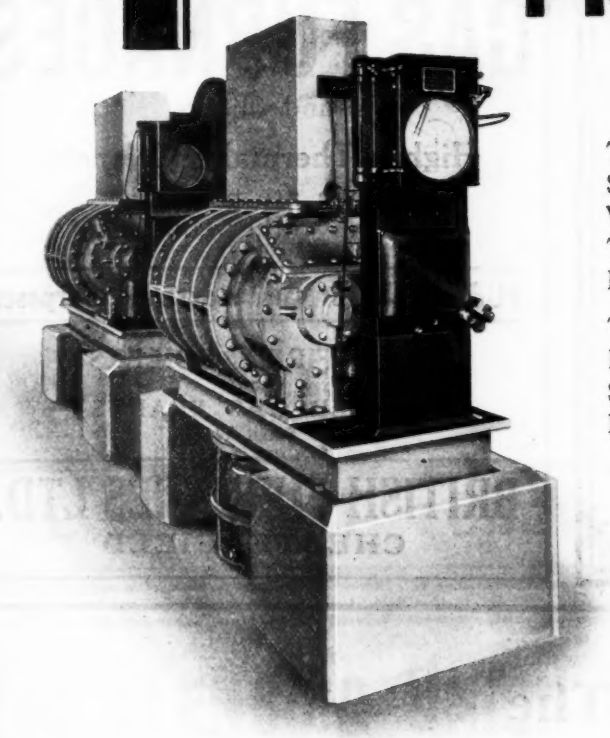

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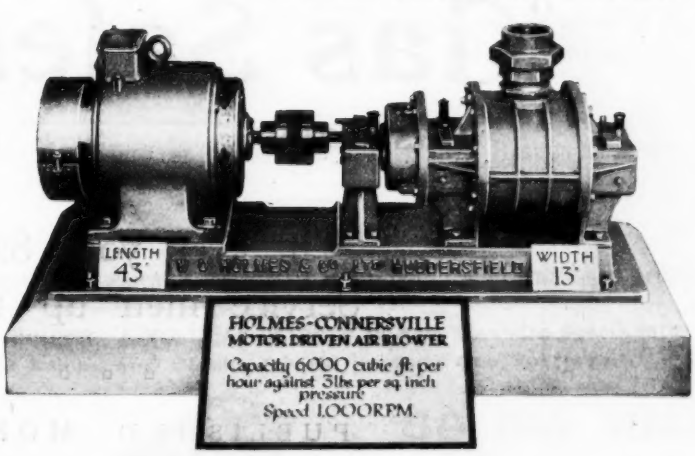

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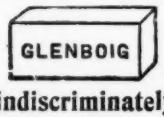
TRADE 

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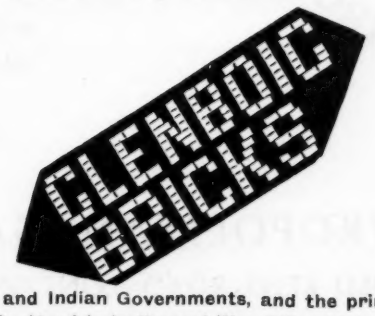

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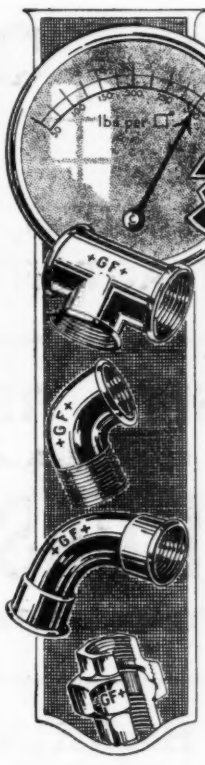

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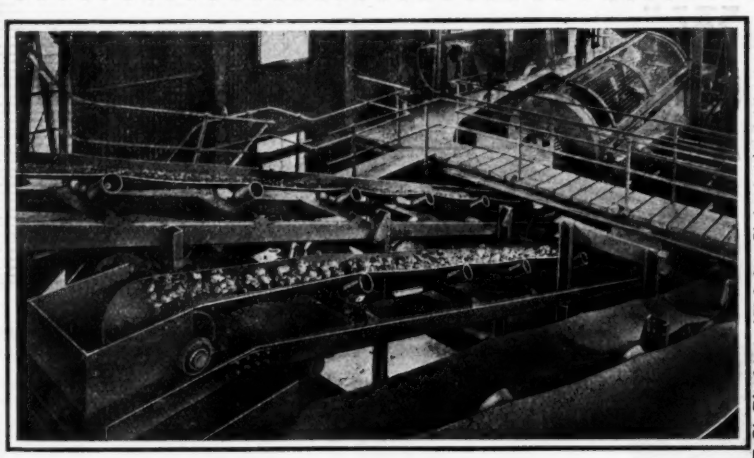

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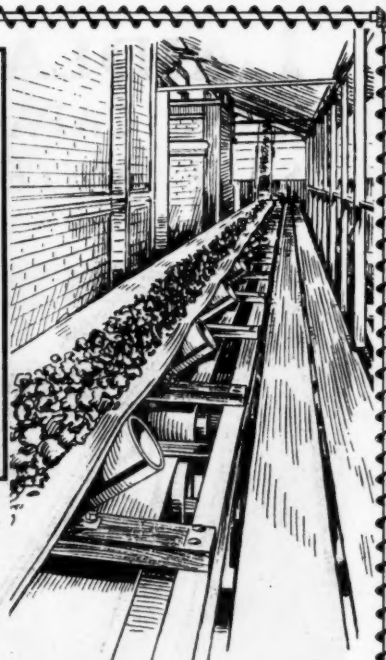

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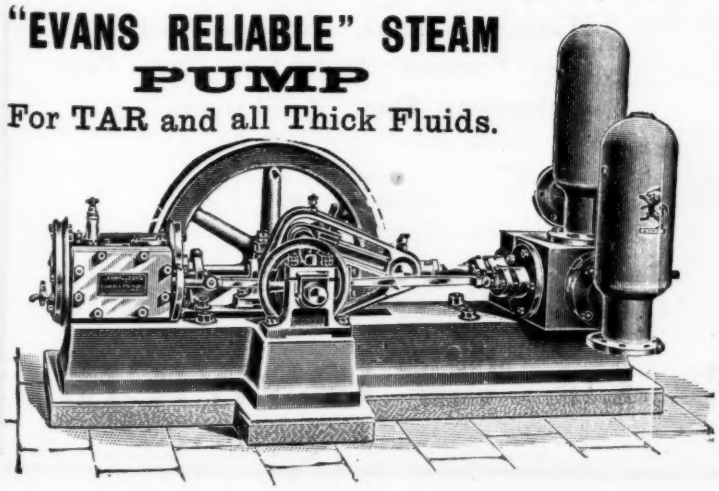

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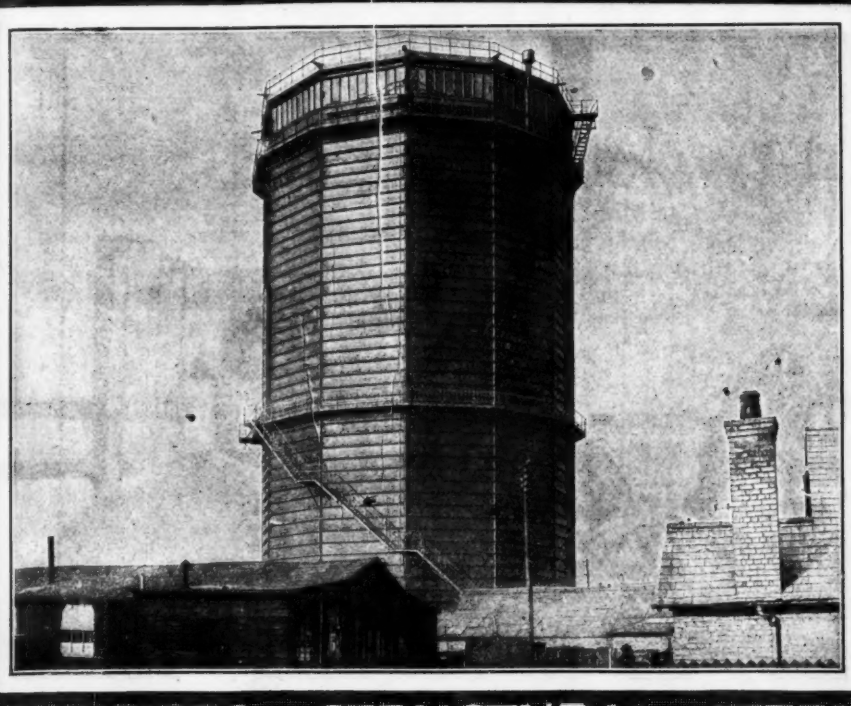

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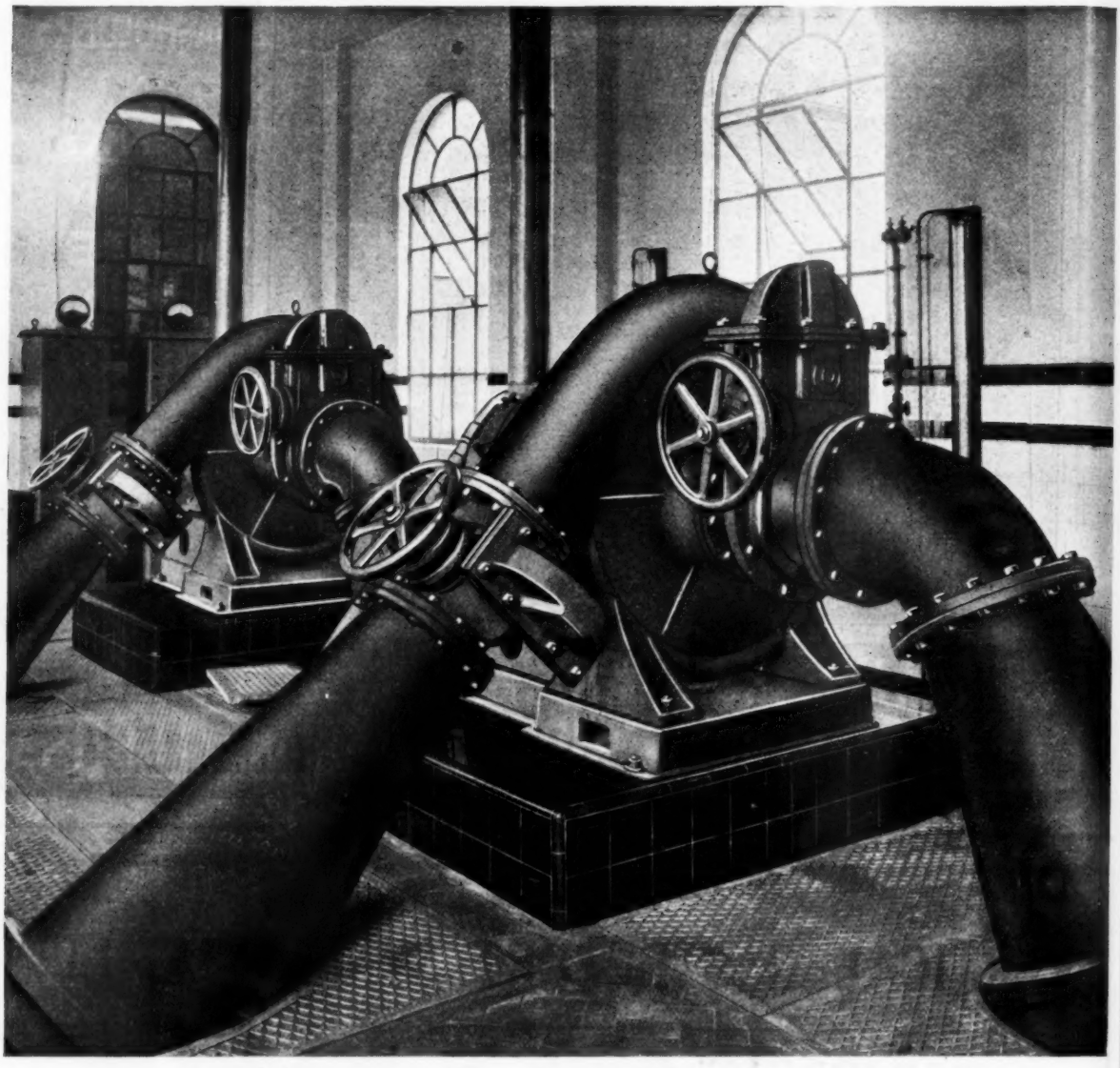

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